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被子植物的一个“多系-多期-多域”新分类系统总览

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Synopsis of a new “polyphyletic-polychronic-polytopic” system of the angiosperms

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Abstract This work is continuation of two papers published by the present authors in 1998, in which our basic viewpoints on the phylogeny and evolution of angiosperms were presented. In this paper, a new outline of classification of the Magnoliophyta (angiosperms) is proposed. The Magnoliophyta are divided into 8 classes, 40 subclasses, 202 orders and 572 families. Among them, 22 new subclasses (**Annonidae**, **Illiciidae**, **Ceratophyllidae**, **Lauridae**, **Calycanthidae**, **Chloranthidae**, **Aristolochiidae**, **Polygonidae**, **Plumbaginidae**, **Bromeliidae**, **Zingiberidae**, **Juncidae**, **Poaidae**, **Paeoniidae**, **Papaveridae**, **Trochodendridae**, **Betulidae**, **Malvidae**, **Ericidae**, **Myrtidae**, **Rutidae**, **Geraniidae**) and 6 new orders (**Degeneriales**, **Aizoales**, **Platanales**, **Dipentodontales**, **Meliosmales**, **Balanitales**) are circumscribed. The number of genera and species in the families and each family's geographical distribution are given.

Key words Classification system; Magnoliophyta; Angiosperms; New subclass; New order

Introduction

This work is continuation of two previously published papers, i.e. “A comprehensive study of ‘Magnoliidae’ sensu lato—with special consideration on the possibility and necessity for proposing a new polyphyletic-polychronic-polytopic system of angiosperms” by Wu, Lu and Tang (1998), and “On primary subdivision of the Magnoliophyta—towards a new scheme for an eight-class system of classification of the angiosperms” by Wu, Tang, Lu and Chen (1998). In both papers, we have discussed the basic principles and methodology of establishing classification system of angiosperms and presented our viewpoints on the evolution on this plant group. It has been emphasized that although we consider that angiosperms are monophyletic in their earliest origin, yet owing to some intrinsic factors in plants themselves and different extrinsic factors appearing on the Earth after the Early Cretaceous explosion of angioperms, some groups might become quite isolated, such as those extant relict taxa, while others might continue to be flourishing for many generations. From these flourishing groups many lineages might have evolved, just like the situation that many branches and leaves may sprout from a single shoot. In such a case, if viewed from a certain cross section of

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time, some lineages are monophyletic-monochronic-monotopic, whereas others are polyphyletic-polychronic-polytopic. Here by "polyphyletic" we mean that during the Early Cretaceous explosion of angiosperms, they were poly-(mono-)phyletic, namely several monophyletic groups might occur on the basis of the extinction of many ancient species. By "polytopic" we do not mean that a same group could have occurred on different continents at the same time; nevertheless, we believe that the modern inter-continental disjunctive distribution pattern of angiosperms can be explained only by using plate tectonics and vicariance biogeography. It is generally considered that angiosperms might have an evolutionary history of 200 (- 230) million years. After their origin from the Pangaea during the Late Triassic to the Early Jurassic, the pro-angiosperms might have undergone a process of differentiation, extinction and re-differentiation of several dozen million years, and then undergone a great explosive radiation in the Early Cretaceous. By that time, the major groups of angiosperms might have appeared, forming 8 major lineages of the early stage of differentiation of angiosperms. These 8 lineages, in this paper, are circumscribed as 8 classes according to Linnaeus' hierarchial system, and a new eight-class system of classification of angiosperms is proposed.

The classification outline of Magnoliophyta proposed in this paper is not only a result of the senior author's accumulation of knowledge on angiosperms from his research of several decades, but also a result of assimilating and summarizing the achievements of many other Chinese botanists of several generations. Particularly we would like to express our respect to the late Professor H. H. Hu. As early as in 1950, he published "A polyphyletic system of classification of angiosperms" (Hu, 1950). Some of his viewpoints on the angiosperm evolution and taxonomic treatments of angiosperm groups presented in that paper took the lead in his contemporary systematists. In addition, we have also referred to several current systems of classification of angiosperms, such as that of Cronquist (1988), of Dahlgren (1989, 1995), Kubitzki (1993 ~ 1998), Mabberley (1997), Takhtajan (1997), APG (1998), Thorne (2000a, 2000b).

To save the space of this paper, most of the bibliography is not listed. For a detailed bibliography we refer our readers to our two papers mentioned above. A detailed discussion of all the families distributed in China has been given in a monographic work "A comprehensive analysis of the families and genera of the Chinese angiosperms", which is being in press. In that book, all the 346 Chinese angiosperm families' systematic position, affinity, geographical distribution and causes for the formation of their modern distribution patterns, and time and place of origin, are critically reviewed based on evidence from morphology (sensu lato), molecular systematics, paleobotany and phytogeography. In addition, the classification system of each family, the taxonomy and geographical distribution of all the Chinese genera and some important genera in the world are introduced; taxonomic problems pending further research in some important families and genera are mentioned.

PHYLUM MAGNOLIOPHYTA (ANGIOSPERMAE) Cronquist, Takhtajan et W. Zimmermann (1966)

Class I. MAGNOLIOPSIDA Brongniart (1843)

Subclass 1. Magnoliidae Novák ex Takhtajan (1967)

Order 1. Magnoliales Bromhead (1837)

1. Magnoliaceae Juss. (1789), (5 ~)15/(100 ~)246*; E. to SE. Asia, N. to S. Amer.

Order 2. Degeneriales C. Y. Wu *et al.*, **ordo et stat. nov**. Based on Degeneriaceae I. W. Bailey et A. C. Smith in J. Arnold Arbor. 23:357. 15 Jul 1942. —Typus: *Degeneria* I. W. Bailey et A. C. Smith

1. Degeneriaceae I. W. Bailey et A. C. Smith (1942), 1/1 ~ 2; Fiji

Order 3. Eupomatiales Takht. ex Reveal (1992)

1. Eupomatiaceae Endl. (1841), 1/2; N. Guinea; E. & SE. Austr.
2. Himantandraceae Diels (1917), 1/2 ~ 3; E. Mal**.; N. Austr.

Order 4. Winterales A. C. Smith ex Reveal (1992)

1. Winteraceae R. Br. ex Lindl. (1830), 4(~ 5 ~ 8)/60 ~ 70(~ 110); Madag. (1/1), Malesia (W), Philippines, Moluccas, Sulawesi to N. Guinea; E. Austr., SW. Pacific, N. Z.***; S. Amer.

Order 5. Austrobaileyales Takht. ex Reveal (1992)

1. Austrobaileyaceae Croiz. (1943), 1/1; NE. Austr.

Order 6. Canellales Cronquist (1957)

1. Canellaceae Mart. (1832), 5 ~ 6/13(~ 16); disj. Florida through Caribbean to Trop. Amer. & Madag. to E. Afr.

Order 7. Lactoridales Takht. ex Reveal (1992)

1. Lactoridaceae Engl. (1888), 1/1; Juan Fernandez

Subclass 2. Annonidae C. Y. Wu *et al.*, **subclass et stat. nov**. Based on Annonaceae Adans., Fam. P1.2:359. Jul – Aug 1763.—Typus: *Annona* L.

Order 8. Annonales Lindl. (1833)

1. Annonaceae Adans. (1763), 120 ~ 130/2150 ~ 2300(~ 2400); widespread in Trop. to Subtr. (Pantropic), in N. Amer. n. to Canadian border.
2. Myristicaceae R. Br.(1810),(16 ~)17 ~ 19/(300 ~)370 ~ 400; widespread in Trop. to Subtr. (Pantropic), usually lowland rain forest, especially in Asia

Subclass 3. Illiciidae C. Y. Wu *et al.*, **subclass et stat. nov**. Based on Illiciaceae A. C. Smith in Sargentia 7: 8. 28 Nov 1947.—Typus: *Illicium* L.

Order 9. Illiciales H. H. Hu ex Cronquist (1981)

1. Illiciaceae A. C. Smith (1947), 1/(40 ~)42(~ 50); E. & SE. Asia, to Malesia; E. N. Amer. to Hispaniola Island
2. Schisandraceae Blume (1830), 2/47 ~ 50; E. Asia to W. Mal. /E.N.Amer.

Subclass 4. Ceratophyllidae C. Y. Wu. *et al.*, **subclass et stat. nov**. Based on Ceratophyllaceae Gray, Nat. Arr. Brit. P1. 2: 395, 554. 1 Nov 1821.—Typus: *Ceratophyllum* L. [Ceratophyllanae Takht. ex Reveal et Doweld (1999), pro superord.]

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* Number of genera/number of species

** Mal. = Malesia, approximately to the area covered by the Flora Malesiana (Steenis, C G G J van ed.)

*** N.Z. = New Zealand

Order 10. Ceratophyllales Bischoff (1840)

1. Ceratophyllaceae Gray (1821), 1/(2~)6(7~11); widespread (cosmopolitan)

Subclass 5. Nymphaeidae J. W. Walker ex Takhtajan (1997)

Order 11. Nymphaeales Dumort. (1829)

1. Hydropeltidaceae Dumort. (1822), 1/1; *Brasenia*, Temp. E. Asia to India, Afr., Austr.; Trop. Amer.
2. Cabombaceae Rich. ex A. Rich.(1822), 1/5; *Cabomba*, Subtr. Amer., ? 1 in Jiangsu of China.
3. Nymphaeaceae Salisb. (1805) [incl. Nupharaceae A. Kern. (1891), Barclayaceae H. L. Li (1955), excl. Euryalaceae], 4/63~80; widespread (cosmopolitan), but mainly N. Temp.
4. Euryalaceae J. Agardh (1858), 2/2; 1 gen. E. Asia; 1 gen. Trop. S. Amer.

Class II. LAUROPSIDA C. Y. Wu, Y. C. Tang, A. M. Lu & Z. D. Chen (1998)

Subclass 6. Lauridae C. Y. Wu *et al.*, **subclass et stat. nov.** Based on Lauraceae Juss., Gen. Pl.: 80. 4 Aug 1789.—Typus: *Laurus* L. [Lauranae Takht.(1997), pro superord.]

Order 12. Laurales Perleb (1826)

1. Lauraceae Juss. (1789)s.l. [incl. Cassythaceae Bartl. ex Lindl.(1833)], (35~)45~52/2850 ~3200(~3500); widespread in Trop. (Pantropic) & few Temp. to Subtr., esp. SE. & E. Asia, Trop. Amer., esp. Brazil
2. Hernandiaceae Blume (1826) s.l. [incl. Gyrocarpaceae Dumort. (1829)], 4(~5)/57~60; Pantropic, but N. to E. Asia (incl. Taiwan of China, Riukiu, Bonin); NW* in Mexico
3. Gomortegaceae Reiche (1896), 1/1; C.& S. Chile

Order 13. Monimiales Dumort. (1829)

1. Monimiaceae Juss. (1809) s. l. [incl. Atherospermataceae R. Br. (1814) & Siparunaceae Schodde (1970)], 34~35/421~440; Trop. & Subtr. esp. S. Hemisph. OW**: Madag. to Mal., but 0 in India, few Afr.; NW: S. Amer.
2. Amborellaceae Pichon (1948), 1/1; New Caled.
3. Idiospermaceae S. T. Blake (1972), 1/1; NE. Austr.
4. Trimeniaceae Gibbs (1917), 1/5; E. Austr. (NSW); N. Guinea to C. Sulawesi, Moluccas, SW. Pacific Isl. incl. Fiji, etc.

Subclass 7. Calycanthidae C. Y. Wu *et al.*, **subclass et stat. nov.** Based on Calycanthaceae Lindl. in Bot. Reg.: ad t. 404. 1 Oct 1819. —Typus: *Calycanthus* L.

Order 14. Calycanthales C. Martius (1835)

1. Calycanthaceae Lindl.(1819), (related with Rosales) 3/9~10; 2 E. Asia; 1/2 (*Calycanthus*: E. N. Amer.)

Subclass 8. Chloranthidae C. Y. Wu *et al.*, **subclass et stat. nov.** Based on Chloranthaceae R. Br. ex Sims in Bot. Mag.: ad t. 2190. 1 Nov 1820.—Typus: *Chloranthus* Sw.

Order 15. Chloranthales A. C. Smith ex J. F. Leroy (1983)

1. Chloranthaceae R. Br. ex Sims (1820), 4/56~75; *Chloranthus* 18, *Sarcandra* 2(3), E. & SE. Asia to Indomal.; *Ascarina* 12, Madag. 1, Mal., Polynesia, N. Z.;

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* NW = New World

** OW = Old World

Hedyosmum 45, Trop. Amer., 1 SE. Asia, Mal.

Class III. PIPEROPSIDA Bartl. (1830)

Subclass 9. Aristolochiidae C. Y. Wu *et al*., **subclass et stat. nov.** Based on Aristolochiaceae Adans., Fam. Pl. 2: 71. Jul – Aug 1763.—Typus: *Aristolochia* L.

Order 16. Aristolochiales Dumort. (1829)

1. Aristolochiaceae Adans. (1763), 6 ~ 8(~ 12)/(350 ~)450 ~ 500; widespread in Trop. to Temp.

Order 17. Rafflesiales Oliver (1895)

1. Mitrastemonaceae Makino (1911), 1/2; 1 E. & SE. Asia to Mal. & Japan; 1 Mexico & C. Amer. & NW. Colombia
2. Rafflesiaceae Dumort. (1829) s.s. (excl. Mitrastemonaceae), 3/15 ~ 18(~ 21); Trop. to few Temp., W. Mal. to SE. Asia & E. Himal.

Order 18. Hydnorales Takht. ex Reveal (1992)

1. Hydnoraceae C. Agardh (1821), 2/7; 1 gen.: drier S. Afr., through Trop. Afr. to Arabia, Madag.; 1 gen.: drier S. Amer. (Paraguay, Argentina)
2. Apodanthaceae Tiegh. ex Takht. (1987), 3/14 ~ 20(~ 30 ~ 35); OW: Trop. E. Afr., W. Asia (Asia Minor to Iran), SW. Austr.; NW: Amer. from S. Calif. & SE. USA. to strait of Magellan
3. Cytinaceae A. Richard. (1824), 2(~ 3)/8 ~ 10; Medit. to W. Asia, Cauc.; Mexico & Salvador

Subclass 10. Piperidae Reveal (1994)

Order 19. Piperales Dumort. (1829)

1. Saururaceae Rich. ex E. Meyer. (1827), 4/6; E. Asia 3 gen.; SW. & E. USA. 2 gen., 1 common with E. Asia
2. Piperaceae C. Agardh (1824) s. l. [incl. Peperomiaceae A. C. Smith (1981)], 9 ~ 10(14)/3000 ~ 3100; Trop., but mainly SE. to E. Asia, Malesia; Trop. Amer.

Class IV. CARYOPHYLLOPSIDA C. Y. Wu, Y. C. Tang, A. M. Lu & Z. D. Chen (1998)

Subclass 11. Caryophyllidae Takht. (1967)

Order 20. Nyctaginales Dumort. (1829)

1. Phytolaccaceae R. Br. (1818) s.l. [incl. Petiveriaceae C. Agardh (1824), 1/1, Trop. & Subtr. Amer., West Indies], 15 ~ 18/65 ~ 75; Trop. to warm Temp., esp. NW
2. Achatocarpaceae Heimerl (1934), 2/6 ~ 10; from Texas, NW. Mexico to Paraguay & Argentina
3. Agdestidaceae Nakai (1942), 1/1; Mexico, Honduras, Nicaragua, West Indies, climbing
4. Stegnospermaceae Nakai (1942), 1/4; SW. N. & C. Amer. scandent
5. Barbeuiaceae Nakai (1942), 1/1; Madag.
6. Nyctaginaceae Juss. (1789), 31/400; Trop. to Subtr., rarely Temp. mainly NW

Order 21. Aizoales C. Y. Wu *et al*., **ordo et stat. nov.** Based on Aizoaceae Martinov, Tekhno- Bot. Slovar: 15. 1820.—Typus: *Aizoon* L.

1. Gisekiaceae Nakai (1942), 1/2(~ 7); Afr., Arabia to Trop. Asia—S. Vietnam & Hainan of China (1 Afr. only)

2. Aizoaceae Martinov (1820) s. l. [incl. Tetragoniaceae Link (1831), 2/85; Sesuviaceae Horaninov (1834), 4/35], 125 ~ 137/1850 ~ 2500; Trop. & Subtr., esp. S. Afr.

Order 22. Cactales Dumort. (1829)

1. Cactaceae Juss. (1789), 97 ~ 100/1400 ~ 1500; New World, Trop. to Temp., esp. hot and dry reg. except *Rhipsalis* (1 to Afr., Madag., Sri Lanka; *Opuntia*, *Hylocereus* few in E. to SE. Asia, Indo-Mal.)
2. Didiereaceae Drake (1903), 4/11; S. & SW. Madag.

Order 23. Portulacales Dumort. (1829)

1. Portulacaceae Adans. (1763), 25 ~ 32/380 ~ 600; widespread (cosmopolitan), but largely S. Hemisphere, extending to western North Amer., poorly in Eurasia
2. Basellaceae Moq. (1840), 4(~ 5)/20; Trop. & Subtr., centered in NW
3. Hectorellaceae Philipson & Skipw. (1961), 2/2; N. Z. (S. Isl.), Kerguélen Isl.

Order 24. Chenopodiales Dumort. (1829)

1. Molluginaceae Raf. (1837), 13(~ 15)/100 ~ 120; Trop. & Subtr., sometimes Temp. (*Corrigiola*), with a center in S. Afr., only *Mollugo* & *Glinus* Pantrop.)
2. Amaranthaceae Adans. (1763), 69 ~ 71/950 ~ 1000; widespread (cosmpolitan), mainly Trop. & Subtr., few Temp., concentrated in Afr. & Amer. Trop.
3. Chenopodiaceae Vent. (1799) s. l. [incl. Halophytaceae Soriano (1984), 1/1, Arid Argentina-Patagonia, linkage with Basellaceae, Portulacaceae], 100 ~ 130 + /1300 ~ 1500; mainly Temp. & Subtr., few Trop.; in salt marsh, deserts & semideserts

Order 25. Caryophyllales Perleb (1826)

1. Illecebraceae R. Br. (1810), (Caryophyllaceae Subfam. Paronychioideae & Scleranthoideae p. p. minor), 23/185 ~ 210; mainly Tethyan region, but widespread, (8 ~ 10 monotypic, 8 ~ 10 oligotypic)
2. Caryophyllaceae Juss. (1789) s.s. [excl. Illecebraceae R. Br. (1810)], 66(~ 70)/2000(~ 2300 ~ 2500); mainly Holarctic to N. Temp., esp. Medit. to Iran-Turanian

Subclass 12. Polygonidae C. Y. Wu *et al.*, **subclass et stat. nov.** Based on Polygonaceae Juss., Gen. Pl.: 82. 4 Aug (1789) —Typus: *Polygonum* L.

Order 26. Polygonales Dumort. (1829)

1. Polygonaceae Juss. (1789), 43 ~ 46(~ 49)/1000 + (~ 1200); widespread, esp. N. Temp., even NW with more Subfam. and Tribes, but OW Temp. with primitive Tribes and Gen. with primitive distr.

Subclass 13. Plumbaginidae C. Y. Wu *et al.*, **subclass et stat. nov.** Based on Plumbaginaceae Juss., Gen. Pl.: 92. 4 Aug 1789.—Typus: *Plumbago* L.

Order 27. Plumbaginales Lindl. (1833)

1. Plumbaginaceae Juss. (1789) [incl. Limoniaceae Ser. (1851)], 22 ~ 27/490 ~ 790; widespread, esp. maritime, Medit. & Irano-Turanian region

Class V. LILIOPSIDA Scopoli (1760)

Subclass 14. Alismatidae Takht. (1967)

Order 28. Alismatales Dumort. (1829)

1. Alismataceae Vent. (1799) s.s. (excl. Limnocharitaceae Takht. ex Cronquist), 12 ~ 14/80 ~ 100; widespread, aquatic or marshy, chiefly N. Hemisphere
2. Limnocharitaceae Takht. ex Cronquist (1981), 3/(7 ~)8 ~ 12; Trop. & Subtr., [1 monotypic OW & NW disj., 1 oligotypic Trop. Amer., 1 monotypic OW]

Order 29. Hydrocharitales Dumort. (1829) s.s. (excl. Aponogetonales)

1. Hydrocharitaceae Juss. (1789) s.l. [incl. Thalassiaceae Nakai (1943), 1/2, Caribbean Ocean & Pacific & Indian Ocean disjuncted; Halophilaceae J. Agardh (1858), 1/4, distr. as above], (15 ~)17(~ 20)/80 ~ 105; widespread (cosmopolitan); aquatic & marshy, oceanic
2. Butomaceae Mirb. (1804), 1/1; Temp. Eurasia, marshy, but run wild in E. Canada & eastern North Amer. or native.

Order 30. Petrosaviales Takht. (1997) [incl. Tofieldiales Reveal & Zomlefer (1998)]

1. Petrosaviaceae Hutch. (1934) nom. cons. [incl. Tofieldiaceae Takht. (1995), Protoliriaceae Makino (1903)], 4 ~ 5/20 ~ 40; N. Temp. & Andes

Order 31. Aponogetonales Hutch. (1934)

1. Aponogetonaceae J. Agardh (1858), 1/(43 ~)45 ~ 47; OW Trop. & S. Afr. aquatic

Order 32. Potamogetonales Dumort. (1829)

1. Potamogetonaceae Dumort. (1829), 2(~ 3)/(85 ~)90 ~ 100; widespread, aquatic & marshy
2. Ruppiaceae Horan. ex Hutch. (1934), 1/3 ~ 7(2 ~ 20); widespread, aquatic, Temp. to Subtr. coast, N. Z., S. Amer.

Order 33. Juncaginales Hutch. (1934)

1. Juncaginaceae Rich. (1808), 5(~ 5)/15 ~ 20; N. & S. Temp. or Cold
2. Maundiaceae Nakai (1943), 1/1; E. Austr.
3. Lilaeaceae Dumort. (1829), 1/1; Brit. Columbia & Idaho to Mexico & High Andes, Chile, Argentina
4. Scheuchzeriaceae F. Rudolphi (1830), 1/1; Arctic & Boreal, sphagnum bog. (S. to Qinghai & NW. Sichuan of China)

Order 34. Najadales Reichenb. (1828)

1. Najadaceae Juss. (1789), 1/(32 ~ 35 ~)40; widespread (cosmopolitan, esp. E. hemisph.), fresh & brackish water, (excl. Arctic & Boreal)

Order 35. Posidoniales Nakai(1943) s.l. [incl. Zosterales Nakai (1943)]

1. Posidoniaceae Hutch. (1934), 1/3(~ 9); Medit. & SE. Asia to Austr. disjuncted
2. Zosteraceae Dumort. (1829), 3/17 ~ 20; Extratrop. (N. & S.) coast, rarely Trop. *Heterozostera*, 1/1 Temp. Australia & Chile coast, 31 m deep.

Order 36. Cymodoceales Nakai (1943)

1. Cymodoceaceae N. Taylor (1909), 5/16 ~ 20; Trop. & Subtr. coastal shallows, few Temp.
2. Zannichelliaceae Dumort. (1829), 4/8 ~ 12(~ 14); widespread, incl. Cape, Austr., S. Pacific; *Zannichellia* Widespread; aquatic submerged *Althenia*, 2, W. Medit.

Subclass 15. Triurididae Takht. ex Reveal (1992)

Order 37. Triuridales Hook. f. (1876)

1. Triuridaceae Gardner (1843) [incl. Lacandoniaceae E. Martines et C. H. Ramos (1989)], 6(~ 8)/40 ~ 45(60 ~ 70); Trop. Afr., Asia., Amer., except Austr., 1 extending to E. Asia

Subclass 16. Aridae Takht. (1997)

Order 38. Arales Dumort. (1829) s.s. [incl. Acorales Reveal(1995)]

1. Acoraceae Martinov (1820), 1/2 ~ 3(~ 4); OW Temp. (esp. E. Asia); N. Am., Eur. only 1 triploid

2. Araceae Adans. (1763) s.l. [incl. Pistiaceae Rich. ex C. Agardh (1822),1/1], 105 (104 ~ 106)/2550 ~ 2980(~ 3300); widespread, esp. Trop. (2 gen. E. Asia & Trop. Amer. disj.); with 2 centers in Trop. Asia & Trop. Amer.
3. Lemnaceae Gray (1821), 4/30 ~ 35; Widespread (cosmopolitan), *Lemna* esp. Arctic

Subclass 17. Liliidae Takht. (1967)

Order 39. Dioscoreales J. D. Hooker (1876) s.l. [incl. Taccales Dumort. (1829), Stemonales Takht. in D. W. Stevenson & Loconte (1995)]

1. Croomiaceae Nakai (1937), 2/5; 1 Japan to E. China; E. N. Amer. (*Croomia*); 1 Assam to W. Mal. (*Stichoneuron*)
2. Stemonaceae Caruel. (1878) s.s., 1(~ 4)/27; Trop. Asia to Japan & Austr.
3. Dioscoreaceae R. Br. (1810) s.s. [excl. Trichopodaceae; but incl. Avetraceae Takht. (1997);1/1, E. Madag., Stenomeridaceae J. G. Agardh(1858), 2/6, W. Mal.], (5 ~ 6)8/650 ~ 880; widespread in Trop. & Subtr., rarely Temp., mainly OW Trop., except Afr. & Trop. Amer.
4. Taccaceae Dumort. (1829), (1 ~)2/10(~ 11 ~ 13); widespread in Trop., esp. SE. Asia, Trop. N. Afr. & Mexico to Amazon, each only 1
5. Trichopodaceae Hutch. (1934), 1/1(or 2/12); S. India, Sri Lanka to W. Mal. (Malay Penins.), E. Madag. disj.
6. Pentastemonaceae Duyfjes (1992), 1/2; Sumatra

Order 40. Paridales Dumort. (1829) [Trilliales Takht. (1997), = Paridae Endl. (1836)]

1. Trilliaceae Chevall. (1827) s.l.[excl. *Scoliopus*, 1/2, W. N. Amer., Takhtajan as fam. (1997) in Cochicales], 3(4 ~ 5)/60 ~ 70; North Temp.

Order 41. Smilacales Lindl. (1833)

1. Smilacaceae Ventenat (1799), 2 ~ 3)/320 ~ 370; Trop. to Subtr., few Temp., esp. E. to SE. Asia, Mal.
2. Ripogonaceae ("Rhipogonaceae") Conran et H. Clifford (1985), 1/6(~ 8); N. Guinea, Solomon Isl., Austr., N. Z. to Stewart Isl.
3. Luzuriagaceae Lotsy (1911), (s.s. 1/4 or) 5 ~ 6/6 ~ 10 or 2/6; S. Amer., N. Z., Australia
4. Petermanniaceae Hutch. (1934), 1/1; E. Austr.
5. Geitonoplesiaceae R. Dahlgren ex Conran (1994), 1/1; E. Austr. (excl. Tasmania), N. Guinea, Philippines, Pac. Isl.
6. Philesiaceae Dumort. (1829) [incl. Lapageriaceae Kunth(1850), excl. Lomandraceae], 2/2 Chile

Order 42. Asparagales Bromhead (1838) [= Asteliales Dumort.(1829)]

1. Convallariaceae Horan. (1834) s.l. sensu Dahlgren [excl. Tricyrtidaceae Takht (1997) and Uvulariaceae A.Gray ex Kunth (1843), Takht. (1997) both to Colchicales; Dahlgren, Brummitt, Kubitzki incl. Ophiopogonaceae Endl. (1841), which is 3/65, E. & SE. Asia], 19/247; Predominently N.Temp., but 3 monotypic or bitypic gen. in E. & SE. Austr.
2. Asparagaceae Juss. (1789) s.s., 1/130 ~ 140; widespread in OW (throughout Afr., most of Eurasia & Austr.)
3. Behniaceae R. Dahlgren ex Reveal (April, 1997), 1/1; S & SE. Afr. (Zimbabwe, Swaziland & E. S. Afr.)
4. Ruscaceae M. Roem. (1840) (in Asparagaceae s. l.), 3/9 ~ 11; Macaronesia,

Medit., Eur., W. Asia

5. Herreriaceae Endl. (1841), 2/7 ~ 9; S. Amer. + 2 Madag. disj.
6. Dracaenaceae Salisb. (1866) s.s. [excl. Nolinaceae Nakai(1943)], 1/50 ± ; Trop. & Subtr., mainly Afr.
7. Nolinaceae Nakai (1943)(*Beaucarnea* = *Nolina*), 3/34 ~ 50; Mexico to SW. USA.
8. Agavaceae Dumort. (1829), 8/300 ± ; NW: S. USA, West Indies to Braz.
9. Phormiaceae J. Agardh (1858) s.l. [incl. Dianellaceae R. A. Salisb.(1866)], 7 (~ 11)/33; OW Trop. esp. Austr. & S. Amer.
10. Blandfordiaceae Dahlgren et Clifford (1985), 1/4; E. Austr.
11. Asphodelaceae Juss.(1789) s.l. [incl. Aloaceae Batsch (1802), 5/460 ~ 479, Arabia, Afr., Madag., Masc.; Simethidaceae C. Dahlgren (1989), 1/6, W. Eur. & Medit.], 16/760; Medit. to C. & E. Asia, Trop. to S. Afr., Madag., Masc., Arabia, Himal., Austr., 1 N.Z., 1 Mexico
12. Asteliaceae Dumort. (1829), 4 ~ 6/35 ~ 50 ~ 53; Mascarene, N. Guinea, to Pacific, Austr., N. Z., Chile
13. Boryaceae M. W. Chase, Rudall et Conran (1997), 2/12; S. Austr.
14. Doryanthaceae R. Dahlgren et Clifford (1985), 1/1 ~ 2; E. Austr. (E. Queensland and N. South Wales = NSW)
15. Anthericaceae J. Agardh (1858) s.s., 9/200; OW Temp. esp. Austr.; 5(~ 6) NW, W. of Rocky mts. & Andes
16. Anemarrhenaceae Conran, M. W. Chase et Ruddal (1997), 1/1; N. to NE. China, N. Korea
17. Johnsoniaceae Lotsy (1911)(Takht. in Anthericaceae s.l. as a tribe), (1 ~)8/(5 ~) 50 ± ; mostly SW. Austr.(7), 2 extending to N. Guinea, coast, 1 extending to S. Afr. & Madag.
18. Aphyllanthaceae Burnett (1835), 1/1; W. Medit. (Portugal to Ital., N. Afr.)
19. Hemerocallidaceae R. Br. (1810), 1/15; C. Eur. to E. Asia (all in E. Asia, 1 to Eur.)
20. Hostaceae Mathew (1988) [= Funkiaceae Horan. (1834)nom. illeg.], 1/23 ~ 26(~ 45); E. Asia
21. Hyacinthaceae Batsch ex Borckh. (1797), 41 ~ 67/650 ~ 900; N. Temp. & S. Afr. (cosmopolitan, but chiefly Medit., S. Afr. & Iran-Turan.)
22. Alliaceae J. Agardh (1858)[incl. Agapanthaceae Voigt (1850)], (30 ~)32/(600 ±) 750(~ 850); widespread, but excl. Trop. Austr. & N. Z.
23. Themidaceae Salisb. (1866), 12/60 ± ; W. N. Amer., 1 extending to Guatemala
24. Hesperocallidaceae Traub (1972), 1/1; Desert of SW. USA
25. Amaryllidaceae J.St.-Hill. (1805), 60 ~ 65/725 ~ 760 ~ 850; widespread, esp. in S. Amer.-Andes Trop. & S. Afr. & Medit.
26. Lomandraceae J. P. Lotsy (1911), (5 ~ 9 ~)14/(65 ~ 72 ~ 100 ±)80; Australia, several spp. In N. Guinea, 1 N. Caled.

Order 43. Xanthorrhoeales Takht. ex Reveal et Doweld (2000)

1. Dasypogonaceae Dumort. (1829), 2/4 or 4/8; SW. Austr.
2. Calectasiaceae Endl. (1838), 1/2; S. & W. Austr.
3. Xanthorrhoeaceae Dumort. (1829) s.l. [incl. Baxteriaceae Takht. (1996), 1/1, SW. Austr.], s.s. 1/28; s.l. 10/90; Austr. (incl. Tasmania)

Order 44. Nartheciales Reveal et Zomlefer (1998)

1. Nartheciaceae Small (1933)[incl. Lophiolaceae Nakai (1943), 1/1, eastern North Amer.; Japonliriaceae Takht. (1997), 1/1, Japan], 10/72 ± or 4/25; N. Temp., 1 extend to S. Amer.

Order 45. Liliales Perleb (1826) s.l. [incl. Iridales Dumort. (1829), Cochicales Dumort. (1829)]

1. Liliaceae Adans. (1763) s.s. [excl. Tricyrtidaceae Takht. (1997), Calochortaceae Dumort.], 11(~ 13)/540 ~ 580; widespread, but mostly N. Temp., esp. E. & C. Asia
2. Medeolaceae Takht. (1987), 1/2 ~ 6; eastern North Amer. to E. Asia
3. Colchicaceae DC. (1804) s.l. [incl. Burchardiaceae, Takht. (1996), 1/5, Austr.], 19/255 (or 15 ~ 16/165 ~ 195); Widespread in OW, esp. Austr. & S. Afr., W. Eur. to W. Asia
4. Calochortaceae Dumort. (1829) [in Colchicales Dumort. (1829); incl. Tricyrtidaceae Takht. (1997), Scoliopaceae Takht. (1996)], 5/100; western North Amer. [from British Columbia (Canada) to Guatemala], E. Asia, esp. abundant in western North Amer. (Madrean)
5. Alstroemeriaceae Dumort. (1829) [Alstroemeriales Hutch. (1934)], 4 ~ 5/150 ~ 160 ~ 200; Trop. to Temp. C. & S. Amer.
6. Geosiridaceae Jonker (1939) (Iridales, incl. in Iridaceae), 1/1; Madag.

Order 46. Melanthiales Dahlgren ex Reveal (1992) s.l. [incl. Tecophilaeales Traub. ex Reveal (1993)]

1. Melanthiaceae Batsch (1802) [incl. Heloniadaceae J. Agardh (1858), 3/10, SE. Asia, 1 eastern North Amer.; Chionographidaceae Takht. (1997), 2/5 ~ 6, E. Asia; Xerophyllaceae Takht. (1996), 1/2, N. Amer.], 12/120 ~ 160; widespread except Afr., mostly N. Temp., S. to SW. Asia. & S. Amer.
2. Iridaceae Juss. (1789) s.l. [incl. Isophysidaceae F. Barkley (1948), 1/1, Tasmania], 20 ~ 80 /(1100 ~) 1800; Trop., Subtr. to few Temp., esp. S. Afr., E. Medit., C. & S. Amer.
3. Ixioliriaceae (Ixiolirionaceae) Nakai (1943), 1/4; Palestine, Turkey through C. Asia to Siberia
4. Campynemataceae Dumort. (1829), 2/4; Tasmania, N. Caled. disj.
5. Eriospermaceae Endl. (1841), 1/(80 ~)90 ~ 100 ± ; S. & SW. Afr.
6. Tecophilaeaceae F. Leyb. (1826) s.l. [incl. Walleriaceae H. Huber ex Takht. (1995), 1/3, Trop. & S. Afr., Madag.], 5 ~ 7 ~ 8/15 ~ 25; Trop. & S. Afr., Madag. (2); S. Amer. (Chile 3) & California (1)
7. Cyanastraceae Engl. (1900), 1/6 ~ 7; Trop. Afr.
8. Lanariaceae H. Huber ex R. Dahlgren (1988), 1/1; S. Afr. (Cape)

Order 47. Hypoxidales Takht. ex Reveal et Doweld (1999)

1. Hypoxidaceae R. Br. (1814), 8 ~ 9/218 ~ 220; NW, OW Trop. & S. Afr.

Order 48. Haemodorales Hutch. (1934)

1. Haemodoraceae R. Br. (1810), (8 ~ 9 ~)13 ~ 14/40 ~ 100; S. Afr., N. Guinea, Austr.; NW (E. SE. N. Amer., Trop. Amer.)
2. Conostylidaceae Takht. (1987), 5 ~ 6/60 ~ 66; SW. Austr.

Order 49. Burmanniales Heintze (1927)

1. Burmanniaceae Blume (1827) s.l. [incl. Thismiaceae J. Agardh (1858), 6/30, SE. Asia, Afr. Amer. (mainly Brazil), Austr., N. Z.], 15 ~ 16(13 ~ 15 ~ 17)/(130 ~) 160; widespread except Europe, mostly Trop. (to Subtr.), esp. Indomal. & Trop. Amer., n. to Japan & E. USA., s. to N. Z.
2. Corsiaceae Becc. (1878), 3/29; N. Guinea, Solomon Isl.; N. Austr.; Chile to Bolivia

Order 50. Orchidales Dumort. (1829)

1. Orchidaceae Adans. (1763) s.l. [incl. Apostasiaceae Lindl. (1833), Neuwiediaceae R. Dahlgren ex Reveal & Hoogland (1991), Cypripediaceae Lindl. (1833)], 869 ~ 888/18500 ~ 21400; widespread, esp. Indomal. & Temp. Amer., primitive taxa either Indomal.- Trop. Amer. or E. Asia-E. N. Amer.

Subclass 18. Bromeliidae C. Y. Wu *et al*., **subclass et stat. nov**. Based on Bromeliaceae Juss., Gen. P1.: 49, 4 Aug 1789—Typus: *Bromelia* L. [Bromelianae R. Dahlgren ex Reveal (1992) pro superorder]

Order 51. Velloziales R. Dahlgren ex Reveal (1992)

1. Acanthochlamydaceae P. C. Gao (1989), 1/1; W. Sichuan to E. Xizang of China
2. Velloziaceae Endl. (1841) s.s. (excl. Acanthochlamydaceae), 7 ~ 8/260 ~ 288; SW. Arabia, Madag., Afr.; S. Amer., esp. Brazil, mostly xerophytic

Order 52. Bromeliales Dumort. (1829)

1. Bromeliaceae Juss. (1789), 51 ~ 59(~ 61)/2340 ~ 2400; Trop. Amer., 1 Trop. W. Afr.

Order 53. Philydrales Dumort. (1829)

1. Philydraceae Link (1821), 3(~ 4)/5 ~ 6; Trop. SE. to E. Asia & Austr.

Order 54. Pontederiales Hook. f. (1876)

1. Pontederiaceae Kunth (1816), 6 ~ 9/32 ~ 35; Trop. & Subtr. (esp. Amer.), few to N. Temp.

Subclass 19. Zingiberidae C. Y. Wu *et al*., **subclass et stat. nov**. Based on Zingiberaceae Adans., Fam. P1. 2: 61. Jul – Aug 1763—Typus: *Zingiber* Mill. [Zingiberanae Takht. ex Reveal (1992) pro superorder]

Order 55. Musales Reveal (1995)

1. Musaceae Juss. (1789) s.s. [excl. Strelitziaceae Hutch. (1934) & Heliconiaceae Nakai (1941)], 2 ~ 3/40(~ 60); OW, Tropics, 1 monotypic SW. China
2. Strelitziaceae Hutch. (1934), 3/7; 1 S. Afr., 1 Madag., 1 E. Trop. S. Amer.
3. Heliconiaceae Nakai (1941), 1/110 ~ 120(150) ~ 200; Trop. Amer., Pacific (Moluccas, Melanesia, to Fiji, N. Caled. Samoa)

Order 56. Lowiales Takht. ex Reveal et Doweld (1999)

1. Lowiaceae Ridl. (1924), 1/10 ± ; S. China to Indochina & Borneo & some of the Pacific Isl.

Order 57. Zingiberales Griseb. (1854)

1. Zingiberaceae Adans. (1763) s.s. (excl. Costaceae Nakai), 47 ~ 52/1100 ~ 1350; Pantropic, center of diversity S. to C., E. China & Japan, SE. Asia, Indomal. to Trop. Austr.
2. Costaceae Nakai (1941), 4/90(~ 120); Pantropic, mainly in C. to S. Amer.

Order 58. Cannales Dumort. (1829)

1. Marantaceae Petersen (1888), (31 ~)32/(370 ~)525 ~ 550; Trop. esp. Amer., a

few members outside Trop. Amer., but primitive

2. Cannaceae Juss. (1789), 1/8 ~ 10(25 ~ 55 ~ 60); mainly Trop. & Subtrop. Amer., also Indochina to China (S. of Yangtze)

Subclass 20. Commelinidae Takht. (1967)

Order 59. Commelinales Dumort. (1829) s.l. [incl. Xyridales Lindl.(1846)]

1. Commelinaceae Mirb.(1804) s.l. [incl. Cartonemataceae Pichon (1946)], 39 ~ 41/640 ~ 650(~ 700); Trop., Subtrop. to few Temp., esp. Afr., S. Asia, Mexico & N. C. Amer., few Temp. E. Asia, S. N. Amer. & Austr.
2. Xyridaceae C. Agardh (1823), 5/250 ~ 260(< 300); widespread in Trop. & Subtr., *Xyris*, OW & NW, extend. to N. Temp., other 4, S. Amer.
3. Mayacaceae Kunth (1842) [Mayacales Nakai (1943)], 1/4 ~ 10 Trop., N. & S. Amer., & W. Trop. Afr. (Angola)
4. Rapateaceae Dumort. (1829) [Rapateales M. Colella ex Reveal. et Doweld (1999)], (14 ~)16 ~ 17/80 ~ 85; Trop. & Subtr. S. Amer. esp. Guyana Highland; 1 monotypic gen. in W. Afr.

Order 60. Eriocaulales Nakai (1930)

1. Eriocaulaceae Martinov (1820), 9 ~ 10/1100 ~ 1200; widespread Trop. esp. Amer., few to Temp. N. Hemisphere but primitive

Subclass 21. Juncidae C. Y. Wu. *et al.*, **subclass et stat. nov**. Based on Juncaceae Juss., Gen. Pl.:43. 4 Aug 1789.—Typus: *Juncus* L. [Juncanae Takht. (1967) pro superorder]

Order 61. Restionales Perleb (1838) s.l. [incl. Flagellariales Takht. ex Reveal et Doweld (1999), Centrolepidales R. Dahlgren ex Takht. (1997)]

1. Flagellariaceae Dumort. (1829) s.s. [excl. Hanguanaceae Airy-Shaw (1965)], 1/4; OW Trop. (from Trop. Afr. to N. Austr., E. to Samoa & Niue), but extending to S. China (incl. Taiwan coast)
2. Restionaceae R. Br.(1810), 55/490; S. Hemisphere, rarely Trop., concentrated mostly in Cape prov., Extratrop. Austr. (incl. Tasmania), but extending to Hainan (China)
3. Centrolepidaceae Endl. (1836), 3 ~ 4/36; Hainan (China), SE. Asia, through Mal. to S. Austr., N. Z., Temp. S. Amer., absent in Afr., Eur. & N. Amer.
4. Joinvilleaceae Tomlinson & A. C. Smith (1970), 1/2; W. Mal. to Pacifc (N. Guinea, Caroline, Solomon, N. Caled., Fiji, Samoa, Hawaii)
5. Anarthriaceae D. F. Cutler & Airy-Shaw (1965), 1/1 ~ 7; SW. Austr.
6. Ecdeiocoleaceae D. F. Cutler & Airy-Shaw (1965), 1/1; SW. Austr.

Order 62. Hydatellales Cronquist ex Reveal et Doweld (1999)

1. Hydatellaceae Hamann (1976), 2/(8 ~ 9 ~)10; Temp. Austr., N. Z., Tasmania, also India (*Trithuria*)

Order 63. Juncales Dumort. (1829)

1. Juncaceae Juss. (1789), (7 ~)8(~ 9)/350 ~ 400(~ 430); N. Temp. & Arctic, Trop. mts., S. to Mal. & S. Amer.(4), S. Afr. (1), N. Z. & Patagonia (1)
2. Thurniaceae Engl. (1907), 1/2 ~ 3; N. Trop. S. Amer. (Guyana Highland and Brazil)

Order 64. Cyperales Hutch. (1934)

1. Cyperaceae Juss.(1789), 48 ~ 102(~ 125)/4350 ~ 5000(~ 5300); widespread (cosmopolitan), esp. Temp. & Cold (most primitive gen. *Scirpodendron* in Indomal.)

Subclass 22. Poaidae C. Y. Wu *et al*., **subclass et stat. nov**. Based on Gramineae Adans., Fam. Pl. 2: 26, Jul–Aug. 1763 —Typus *Poa*, nom. alt.: Poaceae Barnhart (1895) [Poanae Takht. ex Reveal et Doweld, (1999) pro superorder]

Order 65. Poales Small (1903)

1. Gramineae Adans. (1763), nom. alt.: Poaceae Barnhart (1895) s.l. [incl. Bambusaceae Nakai (1943)], 668(~857)/9500~11000; widespread (cosmopolitan), but esp. Trop. & N. Temp. arid

Order 66. Typhales Dumort. (1829)

1. Sparganiaceae F. Rudolphi (1830), 1/14~15; N. Temp. to Austr. & N. Z.
2. Typhaceae Juss. (1789), 1/12~15(~16~30); widespread, esp. N. Temp.

Subclass 23. Arecidae Takht. (1967)

Order 67. Arecales Bromhead (1840)

1. Palmae Adans. (1763), nom. alt.: Arecaceae Schulze Sch. (1832) s.l. [incl. Nypaceae Brongn. ex Le Maout & Dcne. (1868)], 190(~202) /2000~2650(~3000); Trop. to Subtr., but Afr. few, Eur. & N. Amer.

Order 68. Hanguanales R. Dahlgren ex Reveal (1992)

1. Hanguanaceae Airy-Shaw (1965), 1/1~2(5~more); Sri Lanka, SE. Asia to Mal., Palaui Isl., Austr.

Order 69. Cyclanthales J. H. Schaffner (1929)

1. Cyclanthaceae Poit. ex A. Rich. (1824), 12/200~230; Trop. Amer., West Indies

Order 70. Pandanles Lindl. (1833)

1. Pandanaceae R. Br. (1810), 3/780~900; OW Trop. to N. Z.

Class VI. RANUNCULOPSIDA Brongn. (1843)

Subclass 24. Nelumbonidae Takht. (1997)

Order 71. Nelumbonales Nakai ex Reveal (1995)

1. Nelumbonaceae A. Rich (1827), 1/2; E. Asia, N. to S. Russia, E. to Hawai; E. N. Amer., S. to Colombia

Subclass 25. Ranunculidae Takht. ex Reveal (1992)

Order 72. Lardizabalales Loconte (1995)

1. Lardizabalaceae R. Br. (1821) s.s. (excl. Sargentodoxaceae), 9(~10)/35(45~47); E. to SE. Asia; C. Chile (including Juan Fernandez) to S. Peru
2. Sargentodoxaceae Stapf ex Hutch. (1926), 1/1; China (S. of Qingling-Yangtze), S. to N. Vietnam, Laos
3. Menispermaceae Juss. (1789), (65~) 72~79/450~540; Trop. to Subtr., few Temp. but Temp. 1 monotypic gen., NE. Asia; 1 bispecific gen., E. Asia & E. N. Amer. disj.

Order 73. Ranunculales Dumort. (1829)

1. Ranunculaceae Adans. (1763) s. l. [incl. Kingdoniaceae A. S. Foster ex Airy-Shaw (1965) 1/1, W. China; but excl. Hydrastidaceae Martinov (1820) and Paeoniaceae Raf. (1815)], 61~63/2000~2500; mainly N. Temp. & Boreal

Order 74. Circaeasterales Takht. (1997)

1. Circaeasteraceae Hutch. (1926), 1/1; NW. & SE. China, to E. Himalaya

Order 75. Berberidales Dumort. (1829)

1. Nandinaceae Horan. (1834), 1/1; (Himal.?), China (S. of Yangtze) to Japan

2. Leonticaceae Bercht. et J. Presl (1820), 3(~5)/(14~)18; N. Temp.
3. Berberidaceae Juss. (1789) s.s., [incl. Ranzaniaceae Takht. (1994), 1/1, Japan], 3/500~600; N. Temp., but extending to Andes (most primitive gen. *Ranzania*)
4. Podophyllaceae DC. (1817) (Berberidaceae p. p., incl. Podophylloideae and Epimedioideae), (6~7)8/41; N. Temp.

Order 76. Hydrastidales Takht. (1997)

1. Hydrastidaceae Martinov (1820), 1/2; Japan & C. to E. N. Amer. disj.

Subclass 26. Paeoniidae C. Y. Wu *et al.*, **subclass et stat. nov.** Based on Paeoniaceae Raf., Anal. Nat.:176. Apr-Jul 1815.—Typus: *Paeonia* L.

Order 77. Paeoniales Heintze (1927)

1. Paeoniaceae Raf. (1815), 1/30(~50); N. Temp. (Temp. Eurasia, W. N. Amer.)

Order 78. Glaucidiales Takht. ex Reveal (1992)

1. Glaucidiaceae Tamura (1972), 1/1; Japan

Subclass 27. Papaveridae C. Y. Wu *et al.*, **subclass et stat. nov.** Based on Papaveraceae Adans., Fam. P1. 2:425. Jul-Aug 1763.—Typus: *Papaver* L.

Order 79. Papaverales Dumort. (1829)

1. Papaveraceae Adans.(1763), 23/230~325; widespread (cosmopolitan) but most N. Temp.
2. Pteridophyllaceae Nakai ex Reveal et Hoogl. (1991), 1/1; C. Japan
3. Hypecoaceae H. M. Wilk. & J. M. C. Lange (1880), 1/10~20; W. Medit. to Mongolia & N. China; E. Himal. disj.
4. Fumariaceae DC.(1821) s.s. (excl. Pteridophyllaceae, Hypecoaceae), 16/500±; N. Temp., with few Trop. Afr. mts. & S. Afr.

Class VII. HAMAMELIDOPSIDA C. Y. Wu, Y. C. Tang, A. M. Lu et Z. D. Chen (1998)

Subclass 28. Trochodendridae C. Y. Wu *et al.*, **subclass et stat. nov.** Based on Trochodendraceae Eichler in Flora 48: 14. 18 Jan 1865—Typus: *Trochodendron* Siebold & Zucc. [Trochodendranae Takht. ex Reveal (1995) pro superorder]

Order 80. Trochodendrales Takht. ex Cronquist (1981)

1. Trochodendraceae Eichler. (1865), 1/1; E. Asia [Korea, Japan, China (Taiwan)]
2. Tetracentraceae A. C. Smith (1945), 1/1; E. Asia (W. Himal., Myanmar to C. China)

Order 81. Cercidiphyllales H. H. Hu ex Reveal (1992)

1. Cercidiphyllaceae Engl. (1907), 1/2; E. Asia (China, Japan)
2. Eupteleaceae K.Wilhelm (1910), 1/2; E. Asia [1 India (Assam), SW. to C. China, 1 Japan]

Subclass 29. Hamamelididae Takht. (1967)

Order 82. Hamamelidales Grisebach (1854)

1. Hamamelidaceae R.Br. (1818) s.l. [incl. Altingiaceeae Lindl.(1846), Rhodoleiaceae Nakai (1943)], (26~) 30/144; widespread, but chiefly Temp. to Subtr., esp. E. Asia—China

Order 83. Platanales C. Y. Wu *et al.*, **ordo et stat. nov.** Based on Platanaceae T. Lestib., Botanogr. Elém.: 526. Jun 1826—Typus: *Platanus* L.

1. Platanaceae T. Lestib. (1826), 1/6~7(8~10); N. Temp.; Balkan to W. Himal.; 1 sp. in China (Yunnan)-Laos-Vietnam border junct., most primitive; Amer. from

Canada to Mexico

Order 84. Barbeyales Takht. ex Reveal et Takht. (1993)

1. Barbeyaceae Rendle (1916), 1/1; NE. Afr. to adj. Arabia Peninsula

Order 85. Myrothamnales Nakai ex Reveal (1993)

1. Myrothamnaceae Niedenzu (1891), 1/2; S. Trop. Afr., Kenya to S. Afr. to Madag.

Subclass 30. Betulidae C. Y. Wu *et al*., **subclass et stat. nov**. Based on Betulaceae Gray, Nat. Arr. Brit. Pl. 2: 222, 243. 1 Nov 1821 — Typus: *Betula* L. [incl. Faganae Takht. (1997) pro superorder]

Order 86. Betulales Bromhead (1838) s.l. [incl. Fagales Engl. (1892), Corylales Dumort. (1829)]

1. Fagaceae Dumort. (1829), (6 ~)7(8 ~ 12)/700 ~ 880(~ 900 ~ 1000); N. Subtr. to Temp. & Trop. mts., except Trop. Afr.
2. Betulaceae Gray (1821) s.l. [incl. Corylaceae Mirb. (1815)], 6 ~ 7/110 ~ 150; N. Temp to Subtr. & Trop. mts.
3. Nothofagaceae Kuprianova (1962), 1/35 ~ 37; S. Amer. (beyond 33° S) to N. Z., E. Austr., N. Caled., Mal.
4. Ticodendraceae Gómez-Laur. et L. D. Gómez (1991), 1/1; S. Mexico, Costa Rica, Nicaragua, Panama

Order 87. Casuarinales Lindl. (1833)

1. Casuarinaceae R. Br. (1814), 4/(65)96; Trop. Asia, Mal. to Austr. & Pacific (esp. N. Caled.)

Order 88. Juglandales Dumort. (1829) s.l. [incl. Rhoipteleales Novák ex Reveal (1992)]

1. Rhoipteleaceae Hand. - Mazz. (1932), 1/1; SW. China to N. Vietnam
2. Juglandaceae DC. ex Perleb. (1818), 7 ~ 9/59 ~ 70; N. Temp. to Subtr., S. to S. Amer. & Mal.

Order 89. Myricales Engl. (1897)

1. Myricaceae Blume (1829), 3/59 ~ 70; widespread esp. *Myrica* (Eur. 2), but except Medit., Austr., *Comptonia* liv. fossil. 1 E. N. Amer., 1 N. Caled.

Order 90. Buxales Takht.ex Reveal (1995) s.l. [incl. Daphniphyllales Pulle ex Cronquist (1981), Didymelales Takht. (1967) and Simmondsiales Reveal (1992)]

1. Buxaceae Dumort. (1822) s. l. [incl. Stylocerataceae Baill. ex Reveal et Hoogl. (1990)], 4 ~ 5/70 ~ 94; widespread except. Austr. & Pacific
2. Daphniphyllaceae Muell.-Arg. (1869), 1/10 ~ 12(25 ~ 30); E. Asia & Mal. (NE. to Russian Far East), S. to Trop. Austr.
3. Simmondsiaceae Tiegh. ex Reveal & Hoogl. (1990), 1/1; SW. USA to Mexico
4. Balanopaceae Benth. et Hook. f. (1880), 1/9 ~ 10; Austr., N. Caled., Fiji
5. Didymelaceae Leandri (1937), 1/2; Madag.

Class VIII. ROSOPSIDA Batsch (1802)

Subclass 31. Dillenidae Takht. ex Reveal et Takht. (1993)

Order 91. Dilleniales Hutch. (1924)

1. Dilleniaceae R. A. Salisb. (1807), 11 ~ 12/300 ~ 400; Trop. to Subtrop., esp. Austr. (including Tasmania), few *Tetracera* in Afr.

Order 92. Theales Lindl. (1833)

1. Stachyuraceae J. Agardh (1858), 1/5 ~ 6(~ 13 ~ 16); E. Asia (Himal. to Japan)

2. Theaceae Mirb. (1816) s.l. [incl. Asteropeiaceae Takht. ex Reveal & Hoogl. (1990), 1/5, Madag.], (22)24~25/560~610; Trop., Subtr. to warm Temp.
3. Bonnetiaceae L. Beauv. ex Nakai (1948), 3/22~24; S. Asia to W. Mal., Moluccas & N. Guinea, West Indies, Guyana, Brazil, Peru
4. Pentaphylacaceae Engl. (1897), 1/1; S. China to W. Mal. (Sumatra)
5. Sladeniaceae Airy-Shaw (1965), 1/1; SE. Asia [Myanmar, N. Thail. to China (Yunnan)]
6. Oncothecaceae Kobuski ex Airy-Shaw (1965), 1/2; N. Caled.
7. Paracryphiaceae Airy-Shaw, 1/1; N.Caled.
8. Tetrameristaceae Hutch. (1959), 2/4; W. Mal. & Guyana Highland disj.
9. Marcgraviaceae Choisy in DC. (1824), 5/100~123; Trop. Amer.
10. Strasburgeriaceae Engl. & Gilg (1924)[Takht. (1997) in Ochnales], 1/1; N. Caled.
11. Caryocaraceae Voight.(1845), 2/23~25; Trop. Amer.
12. Pellicieraceae L. Beauv. ex Bullock (1959), 1/1; Costa Rica to Ecuador, mangrove

Order 93. Hypericales Dumort. (1829)[=Guttiferales Hutch. (1926)]

1. Clusiaceae Lindl. (1836) nom.alt.: Guttiferae Juss. (1789), s.s. [excl. Hypericaceae Juss. (1789)], 35(~45 s.l.)/860~940 (1370 s.l.); widespread, but mainly Trop. & Subtr.
2. Hypericaceae Juss. (1789), 9/490~500; Temp. (esp. N.), Subtr. to few Trop.

Order 94. Physenales Takht. (1997)

1. Physenaceae Takht. (1985), 1/2; Madag.

Order 95. Medusagynales Takht. ex Reveal et Doweld.(1999)

1. Medusagynaceae Engl. & Gilg (1924), 1/1; Seychelles

Order 96. Elatinales Nakai (1949)

1. Elatinaceae Dumort. (1829), 2/33~35; Temp. to Trop.

Order 97. Ochnales Hutch. ex Reveal (1992)

1. Ochnaceae DC. (1811) s.s. [excl. Sauvagesiaceae Dumort. (1829), incl. Lophiraceae Loudon (1830), 1/2, Trop. W. Afr.], 5(~8)/480; Trop., Subtr. but SE. Asia, Trop. W. Afr. & Amer. disj.
2. Sauvagesiaceae Dumort. (1829), 19~22/120; Trop. Asia to N. Guinea, Afr.; esp. Trop. Amer. (Brazil)
3. Diegodendraceae Capuron (1964), [Takht. (1997) after Sterculiaceae], 1/1; Madag
4. Sphaerosepalaceae Tiegh. ex Bullock (1959) [Rhopalocarpaceae Hemsl. ex Takht. (1987), Takht. (1997) after Sterculiaceae], 2/17; Madag.
5. Scytopetalaceae Engl. (1897), 5/20; Trop. W. Afr.
6. Quiinaceae Choisy ex Engl. (1888), 4/44~50; Trop. Amer., esp. Amazon Basin

Order 98. Ancistrocladales Takht. ex Reveal (1992)

1. Ancistrocladaceae Planch. ex Walpers (1851), 1/12~19; Trop. Afr. to Trop. Asia

Order 99. Nepenthales Dumort. (1829)

1. Nepenthaceae Dumort.(1829), 1(~2)/72~82; Madag., Seychelles, Trop. Asia to Austr. & N. Caled. (Borneo 28, 1 common from Queensland to SW. Guangdong of China)
2. Dioncophyllaceae Airy-Shaw (1952), 3/3; Trop. W. Afr.

Order 100. Lecythidales Cronquist (1957)

1. Barringtoniaceae F. Rudolphi (1830) [Lecythidaceae p.p., quoad Subfam. Planchoni-

oideae, Foetidioideae (= Foetidiaceae Airy-Shaw (1965), 1/17, Mauritius, E. Afr.) & Combretodendroideae], 6/48 ~ 53; Trop. E. Afr., Madag., Trop. Asia to Austr.

2. Lecythidaceae Rich. (1825) s.l. [incl. Asteranthaceae Knuth (1939), 1/1, N. Brazil], 14/232 ~ 237; Trop. S. Amer.
3. Chrysobalanaceae R. Br. (1818) [Chrysobalanales Takht. (1997), after Rosales], 17/460 ~ 500; Trop. to Subtr., esp. Amer., reaching Subtr. N. Amer., S. Afr. & SE. Asia, with some remarkable intercontinental distr. in Afro-Amer.

Order 101. Sarraceniales Bromhead (1838)

1. Sarraceniaceae Dumort. (1829), 3/14 ~ 15; western and eastern North Amer. (2 gen., 1 each.) & Guyana Highland (1 gen.) disj.

Order 102. Flacourtiales Heintze(1927)

1. Flacourtiaceae Rich. ex DC. (1824) s.l. [incl. Lacistemataceae Mart. (1826), 2/14, West Indies, S. Mexico to Argentina; Aphloiaceae Takht. (1985), 1/6 or 1 polymorphic, Trop. E. Afr., Madag., Masc.; Berberidopsidaceae Takht. (1985), 2/4, E. Asia., NE. Austr., Chile disj. typical to Pacific expansion; Bembiciaceae R. Keating et Takht. (1996), 1/1, Madag.; but excl. Kiggelariaceae Link, Samydaceae Vent. Plagiopteraceae Airy-Shaw (1965)], 50 ~ 54/800 ± ; Trop., few Subtrop. (but primitive gen. as *Itoa*, *Carrierea*, *Poliothyrsis* & *Idesia* all in Subtr. E. Asia)
2. Kiggelariaceae Link (1831) (= Flaourtiaceae s.l. Tribe Pangieae), 10 ~ 11/70; Trop. to S. Afr.(*Kiggelaria*), S. & SE. Asia, N. Guinea, Palau Isl., Bismarck Isl., Solomon Isl., NE. Austr.; 1 Mexico (*Chiangiodendron*)
3. Samydaceae Ventenat (1808) (= Flacourtiaceae s.l. Tribes Homalieae & Casearieae), 21/ 340 ~ 413; Trop. S. Amer., mostly Casearieae, 5 monotypic; Trop. W. Afr., mostly Homalieae, 2 monotypic; Trop. Asia only 2 gen.
4. Scyphostegiaceae Hutch. (1926), 1/1; Borneo
5. Peridiscaceae Kuhlmann (1950), 2/2; Trop. S. Amer. (Amazonian Brazil & Venezuela)

Order 103. Passiflorales Dumort. (1829)

1. Passifloraceae Juss. ex Roussel (1806) s.l. (incl. Paropsieae of Flacourtiaceae s.l.), (17 ~) 20/575 ~ 700; Trop. to Subtr., esp. Amer. & Afr.
2. Achariaceae Harms (1897), 3/3; S. Afr.
3. Malesherbiaceae D. Don (1827), 1/27 ~ 35; S. Amer.
4. Turneraceae Kunth ex DC. (1828), 10/100 ~ 120; Trop. & Subtr. Amer. & Afr. disj.
5. Caricaceae Dumort. (1829) [Caricales L.D.Benson (1957), Takht. (1997)], 4/32 ~ 33; S. Amer., Trop. Afr. 1/2.

Order 104. Dipentodontales C. Y. Wu *et al*., **ordo et stat. nov**. Based on Dipentodontaceae Merr. in Brittonia 4: 69, 73. 16 Dec 1941—Typus: *Dipentodon* Dunn

1. Dipentodontaceae Merr. (1941) (formerly in Rosidae, Santalales), 1/1; SW. China to S. China adj. Myanmar, India

Order 105. Violales Perleb (1826)

1. Violaceae Batsch(1802), 20(~ 24)/800 ~ 1000; widespread (cosmopolitan), but only herbaceous *Viola*-Temperate, the biggest gen.

Order 106. Cucurbitales Dumort.(1829) [incl. Begoniales Dumort. (1829), Datiscales Dumort. (1829)]

1. Cucurbitaceae Juss.(1789), 110 ~ 122/775 ~ 960; widespread (cosmopolitan), mainly

Trop. & Subtr., few Temp.

2. Begoniaceae C. Agardh (1825), 3/900 ~ 1000; Trop. to Subtr., few Temp. (*Begonia* esp. in E. Asia & Trop. Amer., prim. Section in common)
3. Tetramelaceae Airy-Shaw (1965) (Datiscaceae R. Br., p.p), 2/2; from SW. India, Sri Lanka, China (S. Yunnan) to N. Guinea, NE. Austr., 1 Mal. (excl. Penins., Java)
4. Datiscaceae R. Br. ex Lindl. (1830), 1/2; south-western North Amer., Crête to W. Himal. disj.

Order 107. Salicales Lindl. (1833)

1. Salicaceae Mirb. (1815), (2 ~)3/(335) ~ 435; widespread (subcosmopolitan) to Arctic but except Mal. & Austr.

Order 108. Tamaricales Hutch. (1926)

1. Frankeniaceae St.-Hilaire ex S.F. Gray (1821), (2 ~)4 ~ 5/50 ~ 90; Temp. to Subtr., saline soil & medit. weather but mainly Medit., W. to Canaries, E. to Mongolia, SW. Africa, Austr., California, S. Amer.
2. Tamaricaceae Link (1821) s.l. [incl. Reaumuriaceae Ehrenburg ex Lindl. (1830)], (3 ~)5/75 ~ 78(~ 102); Eurasia & Africa, esp. Medit. to C. Asia

Order 109. Capparales Hutch. (1924) [incl. Resedales Dumort. (1829), Brassicales Bromhead (1838)]

1. Capparaceae Adans. (1763) s.s. (excl. Pentadiplandraceae & Physenaceae), 35/460 ~ 620(~ 700); widespread in Trop., to warm Temp. (Medit.)
2. Pentadiplandraceae Hutch. & Dalz. (1928), 1/2; Trop. W. Afr.
3. Koeberliniaceae Engl. (1895), 1/2; SW. USA. Mexico to Trop. Bolivia
4. Cleomaceae Horan. (1834) (Subfam. Cleomoideae of Capparaceae), 9(~ 11)/189; widespread in Trop. (esp. Tethyan & Madrean Region)
5. Tovariaceae Pax (1891), 1/2; Trop. Amer.
6. Cruciferae Adans. (1763) nom. alt.: Brassicaceae Burnett (1835), 330 (350 ~ 370)/3500 (3200 ~ 3400); widespread, esp. Temp. (Tethyan & Madrean)
7. Resedaceae DC. ex Gray (1821), 6(~ 7)/80 ~ 89; N. Hemisph, esp. OW, Macaronesia, Socotra, Medit to C. Asia, W. Siberia & NW. India; south-western North Amer. to Mexico (Tethyan & Madrean)

Order 110. Tropaeolales Takht. ex Reveal (1992)

1. Tropaeolaceae Juss. ex DC. (1824), [Takht. (1997) in Rosidae after Sapindales], 3/90; Mexico to cold Temp. Andean Chile

Order 111. Batales Engl. (1907)

1. Bataceae C. Mart. ex Perleb. (1838), 1/2; coasts or Trop. & Subtr. Amer & coasts of N. Guinea & N. Austr.

Order 112. Gyrostemonales Takht. (1997)

1. Gyrostemonaceae Endl. (1841), 5/17 ~ 18; (Drier) Temp. W. Austr., 1 to N. Tasmania

Order 113. Moringales Nakai (1943)

1. Moringaceae Martinov (1820), 1/12(~ 14); semi-arid Afr. to Asia (Arabia to India), widely natural. in Trop.

Subclass 32. Malvidae C. Y. Wu *et al.*, **subclass et stat. nov**. Based on Malvaceae Adans., Fam. Pl. 2: 390. Jul - Aug 1763—Typus: *Malva* L. [Malvanae Takht. (1967) pro superorder]

Order 114. Elaeocarpales Takht. (1997)

1. Elaeocarpaceae Juss. ex DC. (1824) s.l. [incl. Aristoteliaceae Dumort. (1829)], 9/300 ~ 350 (~540); OW Trop. to Subtr., from Madag. to Austr; NW Tropics from Mexico-West Indies to Chile

Order 115. Cistales H. G. L. Reichenb. (1828)

1. Cistaceae Adans. (1763), 8/200; mostly Temp. to Subtr. N. Hemisph., esp. Medit. (E. to Mongolia), some in West Indies & S. Amer.

Order 116. Bixales Lindl. (1833)

1. Cochlospermaceae Planch. (1847), 2/15(17 ~ 34); Trop. to Subtr. (Amer., Afr., SE. Asia to N. Austr.)
2. Bixaceae Kunth. (1822), 1/1(3 ~ 4); Trop. Amer. to West Indies

Order 117. Malvales Dumort. (1829)

1. Plagiopteraceae Airy-Shaw (1965), 1/1 (~2); Myanmar, Thailand & SW. China (Guangxi) dispersed
2. Dirachmaceae Hutch. (1959) (as usu. in Geraniales), 1/1; Socotra Isl. & C. Somalia disj.
3. Tiliaceae Adans. (1763) s.l. [excl. Monotaceae Maury ex Takht. (1987), 2/30, Trop. Afr., Madag.; Pakaraimaeoideae-Dipterocarpaceae, 1/1, Guyana Highland], 46 ~ 53/450 ~ 680; widespread, mostly Trop. to Subtr.; but only *Tilia*, N. Temp.
4. Monotaceae Maury ex Takht. (1987) (incl. *Pakaraimaea*), 4/40; Trop. Afr. (2 gen.) & Trop. Amer. (2 gen.)
5. Dipterocarpaceae Blume (1825) s.s. [excl. Subf. Monotoideae & Pakaraimaeoideae) 13 ~ 14/680 ~ 700; Trop. Asia. esp. Mal., tertiary in E. Afr.
6. Sarcolaenaceae Caruel (1881) [Takht. (1997) puts Diegodendraceae Capuron (1969) 1/1, Madag. & Rhopalocarpaceae Hemsl. ex Takht. (1987) = Sphaerosepalaceae Tiegh. ex Bullock (1959), 2/17, Madag. here, all near Sarcolaenaceae], 9 ~ 10/51 ~ 62; Madag.
7. Huaceae A. Chev. (1947) (with garlic smell), 2/3; Trop. Afr.
8. Sterculiaceae Vent. (1807)s.l. [incl. Byttneriaceae R. Br. (1814)], 67 ~ 69/1500; Trop., Subtr. to warm Temp.
9. Malvaceae Adans. (1763), 116 ~ 120/1500 ~ 1800; widespread, but well-developed in Trop.
10. Bombacaceae Kunth (1822), 26 ~ 30/250 ~ 320; Trop. & Subtrop., esp. Amer.

Order 118. Urticales Dumort. (1829)

1. Ulmaceae Mirbel (1815), 15 ~ 16/175 ~ 200; Trop. to Temp., widespread, esp. N. Hemisphere
2. Moraceae Link (1831), 37 ~ 38/1100 ~ 1200 +; Trop. to warm Temp.
3. Cannabaceae Martinov. (1820), 2(~3)/3 ~ 4; N. Temp.
4. Cecropiaceae C. C. Berg (1978) 6/180 ~ 200; widespread in Trop., but mainly Trop. Amer. & Trop. Afr.
5. Urticaceae Juss. (1789), 45 ~ 49/1000 ~ 1050; widespread, but mainly in Trop.

Order 119. Euphorbiales Lindl. (1833)

1. Euphorbiaceae Juss. (1789) s.l. [incl. several fam. cited by Takht. (1997), but excl. Stilaginaceae & Bischofiaceae], 320 ~ 331/8000 ~ 8100; widespread, but mainly

in Trop.

2. Stilaginaceae C. Agardh (1824), 1/170; OW Trop. & Subtr., esp. Asia (Afr. 10, Austr. few) (≈Icacinaceae)
3. Bischofiaceae Airy-Shaw (1965), 1/2; 1 Indomal., 1 SE. to S. China
4. Pandaceae Engl. et Gilg (1913), 4/18~30; Trop. Afr., SE. Asia to Solomon Isl. & N. Guinea
5. Dichapetalaceae Baill. (1886), 3/160~180; Trop. to Subtr. (SE. Afr. 1), except Australia
6. ? Aextoxicaceae Engl. & Gilg (1920)(~Celastraceae?), 1/1; Chile

Order 120. Thymelaeales Willkomm (1854)

1. Thymelaeaceae Adans. (1763) s.l. [incl. Gonystylaceae Gilg (1897), 1~3/20~25; Nicobar Isl., Mal. to Fiji, centered in Borneo], 50~58/700~750; widespread, but esp. S. Hemisphere—Austr., Trop. & S. Afr.

Subclass 33. Ericidae C. Y. Wu *et al.*, **subclass et stat. nov.** Based on Ericaceae Juss., Gen. Pl.: 159. 4 Aug 1789.—Typus: *Erica* L. [Ericanae Takht. (1967) pro superorder]

Order 121. Ericales Dumort. (1829)

1. Actinidiaceae Gilg et Werderm. (1925) s.s. (excl. Saurauiaceae J. Agardh), 2/58; E. Asia (all gen. spp. centered in China)
2. Saurauiaceae J. Agardh (1858), 1/300; Trop. Amer. (mostly) & Trop. Asia (1 in Austr.)
3. Cyrillaceae Endl. (1841) s.l. [incl. Clethraceae Klotsch (1851), 1/65, E. & SE. Asia, Mal., SE. USA. to C. & S. Amer.], 3/64(~68); Subtr. E. Asia, southeastern North Amer. to S. Amer. 1 gen., Subtr. Amer. 2 gen., Madeira 1 sp.
4. Rhodoraceae Ventenat (1799) s.s. [(Ericaceae s.s. except Ericoideae) (excl. Vacciniaceae, Pyrolaceae, Monotropaceae) (s.s. only for Rhododendroideae, Epigaeoideae)], 43/1756; widespread, but N. & S. Temp., through Trop. mts., esp. Boreal Arctic, Japan, Sino-Himal. & N. Guinea; absent for most of Austr., but present in S. Afr. to Eur.
5. Ericaceae Juss. (1789) s.s. (only for Ericoideae), 17/865; Trop mount.-Temp. Afr., Europe, Atlantic & Indian Isls.
6. Vacciniaceae Adans. (1763) s.l. [(incl. Arbuteae, Enkiantheae, Cassiopeae, Andromedeae, Vaccinieae) (s.s., for Vaccinioideae only)], 53/1590; *Vaccinium* c. 450, esp. Trop., S. to Mal.; but many primitive gen. in China, also N. Amer., Andean S. Amer.
7. Epacridaceae R. Br. (1810), 31~32/375~450; mostly Austr., also Trop. Asia, Pacific, S. Amer.
8. Pyrolaceae Lindl. (1829) (Subfam. Pyroloideae of Ericaceae s.l.), 4/42; N. Temp. esp. E. Asia (few to Trop. mts., mostly circumboreal but *Chimaphila* to Trop. Amer., *Pyrola* to Sumatra)
9. Monotropaceae Nutt. (1818) (Subfam. Monotropoideae of Ericaceae s.l.), 6~7/9~13; N. Temp. mostly monotypic & oligotypic, esp. in E. Asia & W. to E. Amer. (1 even parasit. on *Andromeda*)
10. Empetraceae Gray (1821), 3/5~6; N. Temp., Temp. S. Amer. (Andes and S. Atlantic)

Order 122. Bruniales Dumort. (1829)

1. Bruniaceae R. Br. ex DC. (1825), 12/74 ~ 75; Afr., esp. Cape
2. Grubbiaceae Endl. (1839), 1/3; Cape

Order 123. Geissolomatales Takht. ex Reveal (1992)

1. Geissolomataceae Endl. (1841), 1/1; Cape

Order 124. Fouquieriales Takht. ex Reveal (1992)

1. Fouquieriaceae DC. (1828), 1(~ 2)/11; Arid Mexico to SE. USA.

Order 125. Diapensiales Engl. et Gilg (1924)

1. Diapensiaceae Lindl. (1836), 6(~ 7)/15; N. Temp. to Arctic

Order 126. Styracales Bisch. (1839) s.l. [incl. Sapotales Hook. f. (1868)], Ebenales Engl. (1892)

1. Styracaceae Dumort. (1829), 12/150 ~ 160; E. to SE. Asia to Madag.; Trop. to Temp. Amer., only *Styrax* 1/1 in Medit.
2. Symplocaceae Desf. (1820), 1/250(400 ~ 500); Trop. & Subtr., esp. E. OW, SE. Asia to Malay (108 excl. N. Caled.), except Eur., Afr. to W. Asia; Trop. & warm Amer.
3. Sapotaceae Juss. (1789), 53 ~ 55/975(~ 1100 ~ 1400); Trop., few Temp., esp. OW (SE. Asia to W. Malesia)
4. Sarcospermataceae H. J. Lam (1925), 1/8 ~ 9; Indomal. to SE. E. Asia (SW. China)
5. Ebenaceae Guercke (1891), 3/500; Trop. & Subtr., few Temp. to N. China & Japan
6. Lissocarpaceae Gilg (1924), 1/2; Trop. S. Amer. (from Guyana to Bolivia)

Order 127. Primulales Dumort. (1829) s. l. [incl. Myrsinales Bromhead(1838)]

1. Myrsinaceae R. Br. (1810) s.l. [incl. Aegicerataceae Blume(1833), 1/2, OW Trop.], 42/(1000 ~)2200; widespread in mainly OW Trop., occ. Temp., but extending to E. Asia, S. Afr., N. Z. & Mexico
2. Primulaceae Vent. (1799) s.l. [incl. Coridaceae Agardh (1858), 1/1 ~ 2 or variable, Eur. Medit. to Somali]; 22(~ 26)/(825 ~)1000; widespread, esp. N. Temp., centered in E. & SE. Asia
3. Theophrastaceae Link (1829), 4 ~ 5/90 ~ 110; Mexico & S. Florida & West Indies to N. Paraguay
4. ? Coridaceae J. Agardh (1858), (Takht. in Primulac. as a tribe Corideae), 1/1 ~ 2; Medit. (Eur.2) & Somali disj.

Subclass 34. Rosidae Takht. (1967)

Order 128. Saxifragales Dumort. (1829)

1. Penthoraceae Rydberg ex Britton (1901), 1/2(~ 3); E. to SE. Asia; eastern North Amer. disj.
2. Crassulaceae J. St.-Hil. (1805), 35(33 ~ 38)/(1100 ~)1500(~ 1600); widespread, in dry & warm reg., but centered in Trop., esp. S. Africa, excl. Austr. & W. Pacific
3. Tetracarpaeaceae Nakai (1943), 1/1; Mt. of Tasmania
4. Saxifragaceae Juss. (1789) s. s. [excl. Hydrangeaceae, Grossulariaceae, Iteaceae etc., but incl. Francoaceae A. Juss. (1832), 2/2, Mid Chilean Andes], 29 ~ 31 (35)/(525 ~)550 ~ 660; widespread, esp. Temp. & Cold, few in Trop. mts.
5. Eremosynaceae Dandy (1959), 1/1; SW. Austr.
6. Vahliaceae Dandy (1959), 1/5; Trop. & S. Afr., Madag., from Upper Egypt, Iran to NW. India

Order 129. Greyiales Takht. (1997)

1. Grossulariaceae DC. (1805) s.s. (excl. Escalloniaceae, Polyosmataceae etc.), 1/(150 ~) 160; N. Temp., S. to NE. Afr. & C. Amer., S. Amer. in Tierra del Fuego
2. Greyiaceae Hutch. (1926), 1/3; S. Afr.
3. Iteaceae J. Agardh (1858) [often in Escalloniaceae R. Br. ex Dumort.(1829)], 2/(12 ~)20; E. & SE. Asia to W. Mal., eastern North Amer. (from N. Jersey to Florida), 1/1, E. C. to S.Afr.

Order 130. Cunoniales Hutch. (1924)

1. Cunoniaceae R.Br. (1814) s.l. [incl. Baueraceae Lindl. (1830), 1/4, Temp. E. Austr.], 19 ~ 23/280 ~ 340; S. Hemisphere 30° ~ 35°, esp. Austr., few N. to Philippines, N. Guinea, N. Caled.; NW: S. Amer. to S. Mexico
2. Eucryphiaceae Endl. (1841), 1/5; SE. Austr. (incl. Tasmania), Chile, Argentina
3. Brunelliaceae Engl. (1897), 1/52; NW from Mexico, West Indies, to Venezuela & Andes of Colombia
4. Davidsoniaceae Bange (1952), 1/1(2 ~ 3); NE. Austr.
5. Pterostemonaceae Small (1905) (Takht. in order Saxifragales), 1/2; High mts of Mexico [~ to distr. pattern of *Deutzia* (*Neodeutzia*) & *Abelia*]

Order 131. Haloragales Bromhead (1838)

1. Haloragaceae (Haloragidaceae) R. Br. (1814), 8 ~ 9/100 ~ 145; widespread, esp. S. Hemisphere, [partic. Australia, only *Myriophyllum* world wide, *Proserpinca*, N. Temp. *Lauremburgia*, S. Afr.]

Order 132. Gunnerales Takht. ex Reveal (1992)

1. Gunneraceae Meisn. (1842), 1/40; OW: S. Afr., SE. Afr., Madag. to N. Guinea, N. Z., Tasmania, NW: Mexico to Tierra del Fuego

Order 133. Podostemales Lindl. (1833)

1. Podostemaceae Rich. ex C. Agardh(1822) s.l. [incl. Tristichaceae J. C. Willis (1915)],45 ~ 50/275 ~ 280; widespread in Trop., esp. Amer & Asia, few Temp., moss-like herb of stony rivers, often annual

Order 134. Cephalotales Nakai (1943)

1. Cephalotaceae Dumort. (1829), 1/1; SW. Austr.

Order 135. Rosales Perleb (1826)

1. Rosaceae Adans(1763) s. l. [incl. Amygdalaceae Marquis (1820), Malaceae Small, etc., which are recognized by C. Dahlgren (1989)], 95 ~ 97(110 ~ 115)/2825(~ 3000 ~ 3500); Widespread, esp. N. Temp. to Subtrop. (E. Asia & N. Amer.)
2. Crossosomataceae Engl. (1897), 3/7 or 8 ~ 11; Arid part of W. USA & adj. Mexico
3. Neuradaceae Link (1831)(= Grielaceae)(in ? Malval.), 3/9 ~ 10; Afr. Desert & Medit. to Indian Desert

Order 136. Parnassiales Nakai (1943)

1. Parnassiaceae Martinov (1820) s. l. [incl. Lepuropetalaceae Nakai (1943)], 2/50 ~ 70(or 15); N. Temp. to cold Boreal, esp. E. Asia & north-western North Amer.; *Lepuropetalum*, 1/1 SW. USA., Mexico, C. Chile & Uruguay dispersed

Order 137. Droserales Griseb. (1854)

1. Droseraceae Salisb.(1808), 4/95 ~ 110; widespread, but esp. Austr. & N. Z.

Order 138. Proteales Dumort. (1829)

1. Proteaceae Juss. (1789), 69 ~ 77/1600 ~ 1650; S. Hemisphere to Trop., mostly in S Afr. & Austr., only 2 to E. Asia. Temp. & Subtr.

Order 139. Elaeagnales Bromhead (1838)

1. Elaeagnaceae Adans. (1763), 3/60 ~ 70(40 ~ 50); N. Temp. to Trop. Asia- Trop., Austr. (*Shepherdia* of NW versus *Elaeagnus*, *Hippophae* of OW)

Subclass 35. Myrtidae C. Y. Wu *et al*., **subclass et stat. nov**. Based on Myrtaceae Adans., Fam. Pl. 2: 86. Jul - Aug 1763—Typus: *Myrtus* L. [Myrtanae Takht. (1967) pro superorder]

Order 140. Myrtales Reichenb. (1828)

1. Myrtaceae Adans. (1763), 127 ~ 135/3900 ~ 4620; Trop., Subtr. to mainly S. Hemiphere, warm Temp., esp. Austr., also S. Amer. but *Baeckea*, *Rhodomyrtus*, *Syzygium* N. to Yangtze in China
2. Psiloxylaceae Croiz. (1961), 1/1; Mascarene (Mauritius & Réunion)
3. Heteropyxidaceae Engl. & Gilg (1920), 1/3; SE. Afr.
4. Onagraceae Adans. (1763), 16 ~ 18/650 ~ 680; widespread, but esp. Temp. to Subtrop. Amer. (SW. USA.)
5. Trapaceae Dumort. (1829), 1/3(~ 5)(or 10 ~ 15 ~ 40 microspecies); Trop. to Temp. OW, except Austr.
6. Lythraceae J. St.-Hil. (1805) s.s. [excl. Punicaceae Horan. (1834) & Sonneratiaceae Engl. & Gilg (1924)], 27 ~ 28/600; widespread, but mainly Trop. & Subtr., esp. Amer., few herb in Temp & Cold
7. Oliniaceae Harvey et Sonder (1862), 1/8; E. & S. Afr.
8. Penaeaceae Sweet ex Guillemin (1828), 7/21 ~ 25; Cape
9. Punicaceae Horan. (1834), 1/2; Balkan Penins. to W. Himal., 1 Socotra
10. Sonneratiaceae Engl. & Gilg (1897), 1/5 ~ 6; Coast of E. Afr., Madag. to Trop. Asia, Austr., N. Caled. & W. Pacific, mangrove
11. Duabangaceae Takht. (1986), 1/2 ~ 3; SE. Asia to Indomal., rainforest
12. Crypteroniaceae A. DC. (1868), 3/9 ~ 10; Indomal. to SE. Asia, rainforest
13. Alzateaceae S. Graham (1985), 1/1 ~ 2; Costa Rica to Bolivia
14. Rhynchocalycaceae L. A. S. Johnson & B.G. Briggs (1985), 1/1; E. Natal to Cape
15. Combretaceae R. Br. (1810), 19 ~ 20/500; Trop. to few Subtr., esp. Afr., 1 Subfam. with 1 monotypic gen. in Trop. W. Afr.
16. Memecylaceae DC. (1828), 6/440; widespread in Trop., esp. OW
17. Melastomataceae Juss. (1789), 182 ~ 185/4200 ~ 4500; Trop., Subtr., few to Temp., esp. S. Amer.

Subclass 36. Rutidae C. Y. Wu *et al*., **subclass et stat. nov**. Based on Rutaceae Juss., Gen. Pl.: 296. 4 Aug 1789. —Typus: *Ruta* L. [Rutanae Takht. (1967) pro superorder]

Order 141. Sapindales Dumort. (1829)

1. Staphyleaceae Martinov (1820), 3/22; N. Temp. to Trop. Asia, West Indies, C. & S. Amer.
2. Tapisciaceae Takht. (1987), 2/5; 1 gen. E. C. to SE. China; 1 gen. West Indies to Colombia
3. Sapindaceae Juss. (1789) [incl. Dodonaeaceae Link (1831)], 131 ~ 135/1350 ~ 1500; widespread esp. Trop., Subtr., few to Temp. but more primitive
4. Hippocastanaceae A. Rich. (1823), 2/15; Balkan Penins., E. Asia (W. Himal.,

N. Vietnam to Japan), Temp N. Amer. (Madrean), 1/2 (*Billia*) S. Mexico to N. S. Amer.

5. Aceraceae Juss. (1789), 2～3/113～120(～200); N. Temp., few through Temp. mts. to S. Hemisphere, 1 gen. C. & SE. China disj.
6. Bretschneideraceae Engl. et Gilg (1924), 1/1; Taiwan of China to C. & SE. China to N. Vietnam to Thailand
7. Akaniaceae Stapf (1912), 1/1; NE. Austr.
8. Melianthaceae Link (1831), 2/8～14; Trop. & S. Afr.

Order 142. Burserales Baskerville (1839)

1. Burseraceae Kunth (1824), 16～18/540～550; widespread in Trop. & Subtr., esp. Amer., NE Afr. & Mal.
2. Anacardiaceae Lindl. (1830) s.l. [incl. Julianiaceae Hemsl. (1906), 2/5, Mexico, Peru, Pistaciaceae C. Martius ex Perleb (1838), 1/9～12, Medit. to C. & E. Asia, Mal.; S. USA, Mexico, Guatemala], 68～75/600～900; widespread, mostly Trop., but temp. gen. even primitive
3. Podoaceae Baill. ex Franch. (1889) (very closely related to Anacardiaceae.), (1～)2/3; Sino-Himal. (Nepal, Sikkim to Xizang & Yunnan of China), 1/1 N. Thail.

Order 143. Meliosmales C. Y. Wu *et al*., **ordo et stat. nov**. Based on Meliosmaceae Endl., Ench. Bot.: 564. 15～21 Aug 1841 (Meliosmae).—Typus: *Meliosma* Blume

1. Meliosmaceae Endl. (1841), 2/60～62; S., E. to SE. Asia, N. Guinea to N. Britain, Solomon Isl., Trop. Amer. N. to Mexico, 1 sp. of *Meliosma* may be common with E. Asia; *Ophiocaryon* 1/7, Trop. S. Amer.

Order 144. Sabiales Takht. (1997)

1. Sabiaceae Blume (1851), 1/19～30; E. & SE. Asia to W. Mal. & Solomon Isl.

Order 145. Connarales Takht. ex Reveal (1995)

1. Connaraceae R. Br. (1818), 12/180～380; widespread in Trop., but mainly OW

Order 146. Fabales Bromhead (1838) [for Fabaceae s.l. = Leguminosae Adans. (1763)]

1. Caesalpiniaceae R. Br. (1814), 153/2175; widespread in Trop. to Subtr., few Temp. but primitive
2. Mimosaceae R. Br. (1814), 56～66/2950; widespread in Trop. to Subtr., few to Temp. (esp. Austr. or NW)
3. Papilionaceae Giseke (1792), nom. alt: Fabaceae Lindl. (1836) s.s., 425/12150; Widespread in Trop. Subtr., Temp. & Cold

Order 147. Rutales Perleb (1826)

1. Rutaceae Juss. (1789), 156～158/1650～1800; widespread, but mostly Trop. & Subtr. (esp. OW & S. Hemisphere)
2. Simaroubaceae DC. (1811) s.l. [incl. Leitneriales-Leitneriaceae Benth. et Hook. f. (1880), 1/1, SE. USA; Picramniaceae Fernando et Quinn (1995), 2/47～50, Florida, West Indies, Mexico to N. Argentina], 13～24/110～150; Tropics & Subtr. (few Temp.) (*Ailanthus*, *Picrasma* to N. China)
3. Surianaceae Arnott (1834) s.l. [incl. Stylobasiaceae J. Agardh (1858), 1/2, N. & W. Austr.], 5/7; Trop. littorals (1), Austr. (3), Mexico (1) dispersed (Relict distr.)
4. Meliaceae Juss. (1789), 50～51/565～600(～1300); widespread in Trop. & Subtr., few to warm Temp.

5. Rhadodendraceae Prance (1968), 1/3 ~ 4; Trop. S. Amer.
6. Cneoraceae Vest (1818), 1/3; Canary Isl. (1), W. & C. Medit. (1), Cuba (1)
7. Irvingiaceae Exell et Mendonça (1951), 3 ~ 4/10; 3 gen. Trop. Afr., Madag., 1 gen. SE. Asia to W. Mal.
8. Kirkiaceae Takht. (1967), 2/6; Trop. & S. Afr., Madag.
9. Ptaeroxylaceae J. Leroy (1960) (lying between Rutaceae & Meliaceae), 2 ~ 3/8 ~ 10; Trop. & S. Afr., Madag.
10. Tepuianthaceae Maguire et Steyermark(1981), 1/5; Venezuala & Colombia, lowland savanna

Order 148. Coriariales Lindl. (1833)

1. Coriariaceae DC. (1824), 1/5(~ 20); West Medit., Temp. & Subtr. E. Asia (disj.), N. Guinea to N. Z., S. Pacific Isl. (Solomons, N. Hebrides, Fiji, Samoa, Society Isl.); Amer. (Mexico to Chile)

Subclass 37. Geraniidae C. Y. Wu *et al*., **subclass et stat. nov**. Based on Geraniaceae Adans., Fam. Pl. 2: 384. Jul – Aug 1763—Typus: *Geranium* L. [Geranianae Thorne ex Reveal (1992) pro superorder]

Order 149. Linales Baskerville (1839)

1. Linaceae DC. ex Perleb (1818) s.l., 8(~ 14)/250; widespread, esp. in Temp. & Subtrop. Regions
2. Ixonanthaceae Planch. ex Miq. (1859), 4/21 ~ 23; 1 Trop. Afr., 1 Himal., 1 E. Asia, Indomal. to N. Guinea, 1 Trop. Amer.
3. Erythroxylaceae Kunth (1822), 4/240 ~ 260; widespread in Trop., esp. Andes & Amazon Basin, & Madag., only *Erythroxylon* common in E. Asia & Trop. Amer., Madag., 3 to Austr.
4. Hugoniaceae Arnott (1834), 5/55 ~ 60; OW: Trop. Afr., Madag. to N. Caled., Fiji, NW: Trop. S. Amer.
5. Ctenolophonaceae Exell et Mendonça (1951), 1/3 ~ 4; Trop., W. Afr. & Mal. disj.
6. Humiriaceae A. Juss. (1829), 8/50; OW: 1 gen. in Trop. W. Afr., NW: 7 gen. in Trop. Amer. to Costa Rica

Order 150. Oxalidales Heintze (1927)

1. Oxalidaceae R. Br. (1818) s.s. (excl. *Lepidobotrya*, but incl. *Sarcotheca* Blume 1/11, W.Mal., *Dapania* Korth. 1/3, 1 Madag., 2 Mal. disj.), 5 ~ 6/700(~ 800 ~ 1600); widespread, but the largest genus *Oxalis* esp. S. Amer., 7 Cape
2. ? Averrhoaceae Hutch. (1927), 1/2; Indomal. to SE. Asia, Trop. Amer.
3. Lepidobotryaceae J. Léonard (1950), 1/1; Trop. Afr.
4. Hypseocharitaceae Weddel (1861), 1/8; Andes of S. Amer.

Order 151. Geraniales Dumort (1829) s.l. [incl. Zygophyllales Takht. ex Reveal et Doweld (1999)]

1. Geraniaceae Adans. (1763) s.s. (excl. *Biebersteinia* Stephan, *Viviania* Cav., *Balbisia* Cav. & *Dirachma* Schweinf. ex Balf.f.), 5(~ 7)/ < 750; widespread, but esp. Temp., few Trop., *Geranium* with woody spp. in Hawaii
2. Biebersteiniaceae Endl. (1841), 1/5; from Greece through SW. & C. Asia, to Siberia & W. Tibet of China
3. Zygophyllaceae R. Br.(1814) s.s.(excl. Peganaceae & Nitrariaceae), 25/240 ~ 285; Arid and Subarid Trop. to Subtr., few to warm Temp.

4. Peganaceae Tiegh. ex Takht. (1987), 2/6 ~ 7; S. Eur., Medit., N. Afr. to Mongolia, N. Amer. (NW. Texas to Mexico), 1 monotypic genus, N. Iran to C. Asia
5. Nitrariaceae Berchtold et J. Presl (1820), 1/6(~ 10) Salt desert from N. Afr., SE. Eur. to W. Siberia, Mongolia & N. China, Afghanistan, and coastal regions of Austr.
6. Vivianiaceae Klotsch (1836), 4/6; S. Brazil, Uruguay, Argentina & Chile
7. Ledocarpaceae Meyan (1834), 2/11; western South Amer., esp. Andes
8. Rhynchothecaceae Endl. (1841), 1/1; Andes of S. Amer.
9. Tetradiclidaceae Takht. (1986), 1/1; N. Afr. to Iran-Turanion reg.

Order 152. Balanitales C. Y. Wu *et al*., **ordo et stat. nov**. Based on Balanitaceae Endl., Ench. Bot.: 547. 15 ~ 21 Aug 1841.—Typus: *Balanites* Delile [Takht. (1997) as suborder]

1. Balanitaceae Endl. (1841), 1/25; Trop. & N. Afr. (Mauritania to Egypt), W. India to Myanmar

Order 153. Balsaminales Lindl. (1833)

1. Balsaminaceae A. Rich. (1822), (2 ~)4/(600 ~)800 ~ 900; mainly Trop. Asia & Afr., 1 endem. to Madag., few in N. Temp. circumboreal

Order 154. Polygalales Dumort. (1829) s.l. [incl. Vochysiales Dumort. (1829) & Malpighiales C. Martius (1835)]

1. Malpighiaceae Juss. (1789), 66 ~ 67/1100 ~ 1200; widespread, Trop. & Subtr., esp. S. Amer., but excl. Arct., N. Z. & Polynesia
2. Trigoniaceae Endl. (1841), 3 ~ 4/26; Madag., W. Malesia; Trop. Amer.
3. Tremandraceae R. Br. ex DC. (1824), 3/43; SW. & SE. Austr. (incl. Tasmania)
4. Vochysiaceae A. St.-Hil. (1820) s.l. [incl. Euphroniaceae Marcano-Berti (1989), Trop. Amer. & W. Afr. (1/3)], 8/200 ~ 210; mostly Trop. Amer. & West Indies, but 1 gen. 3 spp. in Trop. Afr.
5. Polygalaceae Hoffmanns. et Link (1809) s.l. [incl. Emblingiaceae Airy-Shaw (1965), 1/1, W. Austr., Diclidantheraceae J. Agardh (1858), 1/8 Trop. S. Amer., but excl. Xanthophyllaceae, which is included in Sapindales by Dahlgren], 17 ~ 19/950; widespread (subcosmopolitan), from Trop. to Temp., except for Arctic, Polynesia and N. Z.
6. Xanthophyllaceae Gagnep. ex Reveal et Hoogland (1990), 1/93 ~ 94; SE. Asia, Indomal., to Austr.
7. Krameriaceae Dumort. (1829), 1/20; S. USA., West Indies, S. Amer. to Chile, Argentina

Order 155. Celastrales Baskerville (1839) s.l. [incl. Cardiopteridales Takht. (1997)]

1. Celastraceae R. Br. (1814) s.l. [incl. Canotiaceae Airy-Shaw (1965), 1/2, SW. USA; Hippocrateaceae A. Juss. (1811), pantropic; Siphonodontaceae Gagnep. et Tardieu ex Tardieu. (1951) 1/7, Indomal. to Austr.], (85 ~ 90)88/860 ~ 1300; Trop. to few Temp.
2. Cardiopteridaceae Blume (1847), 1/2(~ 3); from Assam through SE. Asia, Indomal. to Austr.
3. Lophopyxidaceae H. Pfeiffer (1951), 1/2; Malay Peninsula, Borneo to E. Malesia, to Palau Isl. & Solomon Isl.
4. Goupiaceae Miers (1862), 1/3; Trop. S. Amer. (Guyana Highl. and Surinam, N. Brazil)

5. Stackhousiaceae R. Br. (1814), 3/17 ~ 28; Malesia to Micronesia, Austr. (incl. Tasmania), N. Z.

Order 156. Brexiales Lindl. (1833)

1. Brexiaceae Loudon (1830), 1/2 ~ 10; Madag., Comoros, 1 extending to Tanzania, Mozambique, Zanzibar, 1 Seychelles
2. Rousseaceae DC. (1839), 1/1; Mauritius
3. Ixerbaceae Griseb. (1854), 1/1; N. N. Z. (lower)

Order 157. Corynocarpales Takht. (1997)

1. Corynocarpaceae Engl. (1897), 1/4(~ 7); N. Guinea, Austr., N. Z., SW. Pacific

Order 158. Rhizophorales Tiegh. ex Reveal et Doweld (1999)

1. Rhizophoraceae Pers. (1806), 15/120; Tropics, but mainly OW many mangrove

Order 159. Anisophylleales Takht. ex Reveal et Doweld (1999)

1. Anisophylleaceae Ridl. (1922), 4/29 ~ 30; Trop. W. Afr., Trop. Asia (Indomal.), S. Amer.; (1/1 endem. Borneo, 1/2 Amazon, 1/1 Trop. W. Afr.)

Order 160. Aquifoliales Senft (1856) (Order Icacinales p.p.)

1. Aquifoliaceae DC. ex A. Rich. (1828), 2(~ 4)/400(~ 420); widespread, but *Ilex* essent. E. Asia & S. Amer. disj., *Nemopanthus* 2 sp. E. N. Amer.
2. Phellinaceae Takht. (1967), 1/1 ~ 2; N. Caled.
3. Sphenostemonaceae P. Royen et Airy-Shaw (1972), 1/7; C. Mal., N. Caled. to Trop. Austr.

Order 161. Icacinales Tiegh. ex Reveal (1993)

1. Icacinaceae Miers (1851), 52 ~ 53/300 ~ 400; Trop., few Temp.

Order 162. Metteniusales Takht.(1997)

1. Metteniusaceae H. Karst. ex Schnizlein (1843 ~ 1870), 1/7; Panama to NW. S. Amer.

Order 163. Rhamnales Dumort.(1829) s.l. [incl. Vitales Takht. ex Reveal (1995)]

1. Rhamnaceae Juss. (1789), 49 ~ 51/875 ~ 900; widespread (cosmopolitan)
2. Leeaceae Dumort. (1829), 1/34; OW. Trop., esp. S. & SE. Asia, but also Austr. to Fiji
3. Vitaceae Juss. (1789), 14/750 ~ 850; Trop. & Subtr., fewer in Temp. (but primitive), S. to Trop. Austr., Fiji, Trop. & S. Afr., Amer. (Haiti, Mexico?)

Order 164. Salvadorales R. Dahlgren ex Reveal (1992)

1. Salvadoraceae Lindl. (1836), 3/11; from Africa, Madag. to Pakistan, India, Sri Lanka & SE. Asia (to Hawaii) (Dry warm Trop.)

Order 165. Santalales Dumort. (1829)

1. Santalaceae R. Br.(1810) s.l. [incl. Osyridaceae Martinov (1820), Thesiaceae Vest (1818)], (34 ~)39 ~ 42/450 ~ 540; widespread, but mostly Trop. & Subtr., esp. dry area, mostly hemiparasitic (to parasitic).
2. Misodendraceae J. Agardh (1858) (= Myzodendraceae), 1/8(~ 11); Cool Temp. S. Amer. (Hemiparasitic on *Nothofagus*)
3. Olacaceae Mirbel ex DC. (1824) s.s., (excl. Erythropalaceae & Schoepfiaceae), 23 ~ 24 (~ 27) /180 ~ 250; widespread, esp. Trop. & Subtr., hemiparastic
4. Aptandraceae Miers (1853), 3/5 ~ 6; *Aptandra* 3 S. Amer., 1 gen. SE. Asia, 1 gen. Trop. Afr.
5. Octoknemaceae Soler. (1908), 1/5; Trop. Afr.

6. Erythropalaceae Pilg. et K. Krause(1914), 1/2 Indomal. to SE. Asia & S. China
7. Schoepfiaceae Blume (1850), 1/(19～20)23; E. to Trop. Asia (3); Trop. Amer. (20)
8. Opiliaceae Valeton (1886), 11(10)/32～36; widespread in Trop. & Subtr., esp. Asia
9. Loranthaceae Juss. (1808), 65～68(～77)/900; widespread in Trop. & Subtr., esp. S. Hemisphere, hemiparasitic
10. Eremolepidaceae Tiegh. ex Nakai (1952), 1/3; Trop. Amer. along Andes from Chile to Colombia, Venezuela to Mexico (Chiapas), hemiparasitic
11. Viscaceae Batsch (1802), 7/335～450; very widespread, esp. in Trop. & Subtr., hemiparasitic

Order 166. Medusandrales. F. Novák ex Takht. (1997)

1. Medusandraceae Brenan (1952), 2/9; Equatorial W. Afr.

Order 167. Balanophorales Dumort. (1829), [Takht. (1987～1997), all after Rafflesianae]

1. Balanophoraceae Rich. (1822) s. l. [incl. Mystropetalaceae Hook. f. (1853), 1/1, Cape; Dactylanthaceae Takht. (1987), 2/2, 1 N. Caled., 1 N. Z.; Lophophytaceae Horan. (1847), 8/10, Trop. & Subtr. S. Amer.; Sarcophytaceae A. Kerner (1891), 2/3, Trop. E. Afr. & S. Afr. & Trop. W. Afr. disj.; Scybaliaceae A. Kerner (1891), 1/4, Great Antilles, Colombia, Ecuador, SE. Brazil; Helosidaceae Bromhead (1840), 5/11, Mexico to S. Amer., Madag., Himal., SE. Asia to W. Mal.; Langsdorffiaceae Tiegh. ex Pilger et K. Krause (1914), 2/2, Trop. Afr. & Trop. Amer.], (17～)18/44(50～120); Trop. & Subtr., many monotypic & oligotypic taxa, all root parasite.

Order 168. Cynomoriales Burnett (1835)

1. Cynomoriaceae Engl. ex Lindl. (1833), 1/2; Medit. from Canary through S. Arabia to C. Asia, Mongolia E. up to N. China, all from Morocco to Egypt, S. to Somalia on coast

Subclass 38. Cornidae Frohne et Jensen ex Reveal (1994)

Order 169. Hydrangeales Nakai (1943)

1. Polyosmaceae Blume (1851) [Escalloniaceae R. Br. ex Dumort. (1829), p.p.], 1/60 ± ; Himal. through SE. Asia to N. Guinea, Trop. Austr. & N. Caled.
2. Hydrangeaceae Dumort. (1820) s.l. [incl. Kirengeshomaceae Nakai(1943), Philadelphaceae Martinov (1820)], 16～17/190～250; N. Temp., S. to Mal., Hawaii
3. Pottingeriaceae Takht. (1987), 1/1; Upper Myanmar, NW. Thailand to Yunnan of China
4. Escalloniaceae R. Br. ex Dumort. (1829) s.s., 7/90; S. Hemisphere, *Escallonia* 40 S. Amer. esp. Andes, other 1 gen. 25 spp. Malesia to Austr., 1 monotypic, 1 bitypic in Austr., 1 monotypic Chile, 1 monotypic Réunion
5. Abrophyllaceae Nakai (1943), 1/3; E. Austr.
6. Argophyllaceae Takht.(1987), 1/11; Trop. Austr., N. Caled.
7. Corokiaceae Kapil ex Takht. (1997), 1/4; Austr. (NSW) to N. Z., Polynesia
8. Alseuosmiaceae Airy-Shaw (1965), 3/8～12; SW Pacific
9. Carpodetaceae Fenzl (1841), 1/10; N. Guinea, Solomon Isl., N. Z.
10. Phyllonomaceae Small (1905), 1/4; Mexico to C. Panama, NW. Bolivia

11. Roridulaceae Engl. et Gilg (1924), 1/2; Temp. S. Afr. (Cape)
12. Desfontainiaceae Endl. (1841), 1/5(~ 1); Andes from Costa Rica to Cape Horn
13. Tribelaceae Airy-Shaw (1965), 1/1; Temp. S. Amer., S. Chile
14. Melanophyllaceae Takht. ex Airy-Shaw (1972), 1/8; Madag.
15. Montiniaceae Nakai (1943), 2/4; S. Afr. & Trop., W. & E. Afr., Madag.
16. Kaliphoraceae Takht. (1996), 1/1; Madag.
17. Columelliaceae D. Don (1828), 1/4; Andean S. Amer., from Colombia to Bolivia

Order 170. Cornales Dumort. (1829) s.l. [incl. Aucubales Takht. (1997), Torricelliales Takht. ex Reveal et Doweld (1999)]

1. Cornaceae Dumort. (1829) s.s. [incl. Curtisiaceae Takht. (1987), 1/2, S. & Trop. SE. Afr.], 7 ~ 8/57 ~ 60; N. Temp. to Arctic; NW s along Andes from C. Amer. to Peru, Bolivia; in Afr. from E. Afr. to S. Afr.
2. Nyssaceae Juss. ex Dumort. (1829), 2/10; E. Himal., Assam to C. China, SE. Asia, E. N. to C. Amer., but south to W. Mal. & C. Amer.; 1 gen. endemic to China (S. of Yangtze.)
3. Mastixiaceae Calestani(1905), 2/(14 ~)16(~ 26); *Diplopanax*, SW. China to Vitenam; *Mastixia*, Sri Lanka, SW. & NE. India, N. Myanmar, SW. China to Hainan, SE. Asia, Mal. to N. Brit. Isl., Solomon Isl.
4. Davidiaceae H. L. Li (1955), 1/1; C. to SW. China
5. Alangiaceae DC. (1828), 1/19 ~ 21(~ 30); OW Tropics, mostly to E. Asia (Eocene fossil in Eur.)
6. Aucubaceae J. Agardh (1858), 1/6(~ 11 ~ 14); E. Asia
7. Torricelliaceae H. H. Hu (1934), 1/2; E. Himal. to C. China

Order 171. Griseliniales Takht. ex Reveal et Doweld (1999)

1. Griseliniaceae J. R. Forster & G. Forster ex Cunningham (1839), 1/6; S. Hemisphere: N. Z., Chile, Paraguy, SE. Brazil

Order 172. Garryales Lindl. (1846)

1. Garryaceae Lindl. (1834), 1/3; western North Amer.: from Washington to Panama, 1 in Great Antilles

Order 173. Aralidiales Takht. ex Reveal (1992)

1. Aralidiaceae Philipson et B. C. Stone(1980), 1/1; S. Thailand, Malay Penins., Sumatra & Borneo

Order 174. Eucommiales Němejc ex Cronquist (1981)

1. Eucommiaceae Engl. (1909), 1/1; N., E., C. to SW. China

Order 175. Araliales Hutch. ex Reveal(1995)[= Apiales Nakai (1930)] s.l. [incl. Helwingiales Takht. (1997)]

1. Helwingiaceae Decne. (1836), 1/3 ~ 5; E. Asia, China (all in cont. to Taiwan), E. Himal., Assam, upper Myanmar, N. Vietnam, Riukiu
2. Araliaceae Juss. (1789), 47 ~ 52/1200 ~ 1325; Trop. esp. Indomal., Amer., few Temp. but with archaic distr., fossil from upper Cretaceous.
3. Hydrocotylaceae N. Hylander (1945), 42/290; Temp. to Trop. mts., esp. S. Hemisphere, centered in S. to C. Amer.
4. Umbelliferae Juss. (1789), nom. alt.: Apiaceae Lindl. (1836), 444 ~ 455/3390 ~ 3540(~ 3751); widespread, but mainly N. Temp., particularly Medit. & Iran-Turanian Reg.

Order 176. Pittosporales Lindl. (1833)

1. Pittosporaceae R. Br. (1814), 9 ~ 11/200 ~ 240(~ 300 +); OW Trop. to warm Temp., esp. Austr. (6 endemic gen.)

Order 177. Byblidales Nakai ex Reveal (1993)

1. Byblidaceae Domin (1922), 1/2; southermost N. Guinea & SW. Austr. disj.

Order 178. Viburnales Dumort. (1829) s.l. [incl. Adoxales Nakai (1949)]

1. Viburnaceae Rafinesque (1820) (usu. in Caprifoliaceae), 1/150 ~ 200; N. Temp., few to Trop. mts., in Mal. crossing the equator.
2. Sambucaceae Batsch ex Borck-hausen (1797), 1/9(~ 27); Temp. to Subtr., esp. E. Asia & N. Amer., but also to N. & Trop. E. Afr., E. Austr. (incl. Tasmania)
3. Adoxaceae E. Meyer (1839), 3/4; N. Temp., esp. W. China

Order 179. Dipsacales Dumort. (1829)

1. Caprifoliaceae Adans. (1763) s.s. [excl. *Viburnum* & *Sambucus*, Carlemanniaceae Airy-Shaw (1965)], 12 ~ 13/260 ~ 290; mostly N. Temp., esp. E. Asia & E. N. Amer., 1 circumboreal, few crossing the equator in Mal.
2. Valerianaceae Batsch (1802) s.s. (excl. Triplostegiaceae), 9(~ 15)/400; widespread, esp. N. Temp. centered in Medit. to Asia, also Andes but absent from Austr., N. Z., most reg. of Afr.
3. Triplostegiaceae Bobrov ex Airy-Shaw (1965), 1/2; Temp.; 1 alp. Himal., Assam to China (C. & Taiwan); 1 Sulawesi & N. Guinea disp. & SW. China disj.
4. Dipsacaceae Juss. (1789), (7 ~)11 ~ 14/290; OW Temp., esp. Medit. to W. Asia, also Trop. to S. Afr.
5. Morinaceae Rafinesque (1820), 2(~ 3)/13; OW Temp., from Balkan through Lebanon, Israel to Himal. & W. China

Subclass 39. Asteridae Takht. (1967)

Order 180. Campanulales Reichenb. (1828)

1. Pentaphragmataceae J. Agardh (1858), 1/25 ~ 30; Lower Myanmar, S. China, SE. Asia, Malesia
2. Sphenocleaceae C. Mart. ex DC. (1839)(in Campanulaceae s. l.), 1/2; 1 widespread in Trop., 1 Trop. W. Afr.
3. Campanulaceae Adans. (1763) s.s. (excl. Lobeliaceae), (44 ~)55(~ 60)/950 ~ 1000; widespread but *Campanula* mostly in N. Hemisphere & *Wahlenbergia* mostly in S. Hemisphere, others mostly Tethyan & Madrean
4. Lobeliaceae Juss. (1813), 29/1200; widespread, mostly Trop & Subtr., esp. S. Hemisphere
5. Cyphocarpaceae Reveal et Hoogland (1995) [based on subfam Cyphocarpoideae Miers (1848)], 1/2; Chile
6. Nemacladaceae Nuttall (1843), 3/15; Mexico to SW. USA.
7. Cyphiaceae DC. (1839), 1/60; Trop. & esp. S. Afr.

Order 181. Goodeniales Lindl. (1833)

1. Goodeniaceae R. Br. (1810), 12/400 ~ 420; widespread, mostly Atl. & Indian Ocean, but extending to NE. in Pacific, incl. E. Asia, Philippine, Hawaii, N. Z. & Chile
2. Brunoniaceae Dumort. (1829), 1/1; Austr. (incl. Tasmania)

Order 182. Stylidiales Takht. ex Reveal (1992)

1. Stylidiaceae R. Br. (1810), 5/154; S. & SE. Asia, Austr., southern South Amer.

2. Donatiaceae B. Chandler (1911), 1/2; N. Z., Tasmania, the Antarctic, S. Amer.

Order 183. Menyanthales T. Yamazaki ex Takht. (1997)

1. Menyanthaceae Dumort. (1824), 5/40 ~ 60; widespread (subcosmopolitan) but mainly N. Temp.

Order 184. Asterales Lindl. (1833)

1. Compositae Adans. (1763), nom. alt.: Asteraceae Martinov (1820), 1509 ~ 1528 (~ 1550)/22750 ~ 23000; widespread (cosmopolitan), the most primitive tribe Mutisieae esp. S. Amer. & E. Asia in distribution

Order 185. Calycerales Takht. ex Reveal (1995)

1. Calyceraceae R. Br. ex Rich. (1820), 6/50 ~ 55; mainly extratropical C. & S. Amer.

Subclass 40. Lamiidae Takht. ex Reveal (1992)

Order 186. Oleales Lindl. (1833)

1. Oleaceae Hoffmannsegg et Link(1809) [incl. Nyctanthaceae J. Agardh (1858)], 24/615 ~ 900; widespread, Trop. to N. Temp., esp. E. Asia & E. N. Amer. (primitive), S. to Trop. OW

Order 187. Gentianales Lindl. (1833)

1. Gelsemiaceae L. Struwe et V. A. Albert (1995), 2/8 ~ 10; half E. & SE. Asia, SE. & southern North Amer.; half Trop. Afr., Madag. (7) & S. Amer. (1)
2. Plocospermataceae Hutch. (1973), [related to Gelsemiaceae, but in Lamiales (Thorne 2000) or Apocynaceae (Cronquist 1981), Hutch. (1973) in Apocynales], 1/1; S. Mexico to Guatemala
3. Strychnaceae DC. ex Perleb (1826), 3/200; E. & SE. Asia, E. Malesia, Melanesia, Fiji
4. Geniostomaceae L. Struwe et V. A. Albert (1995), 2/67 ~ 75; Mal. to Japan, N. Z. & Hawaii
5. Spigeliaceae C. Martius (1827), 3 ~ 4/90 ~ 97; Madag., Austr., N. Z., New Caledonia, Indomal. to E. Asia, N. & S. Amer.
6. Gentianaceae Juss. (1789) s.l. [incl. Potaliaceae C. Martius(1827)], 77 ~ 80/1200 ~ 1225; widespread (almost cosmopolitan), but mainly N. Temp. to Trop. mts.
7. Antoniaceae Hutch. (1959), 4/8; Trop. W. Afr. (1), Trop. S. Amer. (1), Trop. Mal. (1) disj.
8. Loganiaceae R. Br. ex C. Martius (1827) s. s., 1/15; N. Caled. (1 sp.), N. Z. (1 sp.), Austr. (13 spp.)
9. Saccifoliaceae Maguire et Pires (1978), 1/1; Guyana Highland

Order 188. Rubiales Dumort. (1829)

1. Naucleaceae Wernham (1911) (Rubiaceae—Subfam. Cinchonoideae Tribe Naucleeae), 19 ~ 20/147 + ; Many monotypic gen. in E. & SE. Asia to Indomal.; (8) gen. E. Asia, (4) Mal., (2) Trop. Afr., only *Cephalanthus* N. Amer., *Uncaria* 34 Trop. with 2 spp. S. Amer.
2. Rubiaceae Juss. (1789) s. s. (excl. Naucleaceae Wernham), 606 ~ 610/10200 ~ 11000; Widespread (cosmopolitan), but most Trop. & Subtr., some in Temp. & Cold, even bipolar
3. Theligonaceae Dumort. (1829), 1/3; 1 Macaronesia, Medit. to W. Asia, 1 SW. China, 1 Taiwan of China to Japan disj.
4. Carlemanniaceae Airy-Shaw (1965), 2/4; Trop. Asia extend. to Sinohimal. & N. Viet-

nam

5. Dialypetalanthaceae Rizzini & Occhioni (1948), 1/1; Amazon Brazil & Peru

Order 189. Apocynales Bromhecd (1838) s.l. [incl. Asclepiadales Dumort. (1829)]

1. Apocynaceae Adans. (1763), 165 ~ 168/1900; widespread, esp. Trop., few Temp.
2. Periplocaceae Schlechter (1905), 55/200; OW Trop. to 1 (Temp.), esp. Trop. Afr.
3. Asclepiadaceae Borkh. (1797), 260 + /3000 + ; Trop. to Temp., mostly S. Afr.

? **Order 190.** Loasales Bessey (1907)

1. Loasaceae Dumort. (1804) s.l. [incl. Gronoviaceae Endl. (1841)], (3 ~)5/260 ~ 300; Temp., Subtr. to Trop. Amer., from SW. Canada through West Indies, Galapagos to Argentina & Chile, only 2 gen. 2 sp. in SW. Afr., 1 *Fissonia* in Somalia, NE. Ethiopia to S. & SW. Arab.

Order 191. Solanales Dumort. (1829)

1. Solanaceae Adans. (1763) s.l. [incl. Nolanaceae Dumort.(1829)], 96/2300 ~ 2950; Widespread (subcomospolitan), esp. diversified in S. Amer. (26 gen. endem.), but N. Temp. with paired gen. of E. Asia-N.(or S.) Amer.
2. Sclerophylacaceae Miers (1848), 1/12; Argentina, Paragay, Uruguay, Halophyte
3. Duckeodendraceae Kuhlmann (1950), 1/1; Amazon Basin in Brazil
4. Goetzeaceae Miers ex Airy-Shaw (1965), 4/5; Great Antilles (Cuba, Haiti, Hispaniola, Puerto Rico)

Order 192. Convolvulales Dumort. (1829)

1. Convolvulaceae Juss. (1789) s. l. [incl. Humbertiaceae Pichon (1947), 1/1, Madag., Dichondraceae Dumort. (1829)], (55 ~)56(~ 58)/1600 ~ 1700; widespread (subcosmopolitan), but esp. Subtr. Amer. and Asia
2. Cuscutaceae Dumort.(1829), 1/145 ~ 170; widespread (cosmopolitan), esp. in Subtr. Amer.

Order 193. Polemoniales Bromhead (1838)

1. Polemoniaceae Juss. (1789) s.l.[incl Cobaeaceae D. Don (1824)], 19 ~ 20(27)/290 ~ 320; mainly N. Amer., esp. NW. but also Chile, Peru, and Temp. Eurasia

Order 194. Boraginales Dumort. (1829)

1. Hydrophyllaceae R. Br. (1817), 17 ~ 19/250 ~ 270; mainly Amer., esp. W. USA., but also Afr., Trop. E. Asia to SE. Asia and NE. Asia, Hawaii, N. & NE Austr.
2. Cordiaceae R. Br. ex Dumort.(1829) s.l. [incl. Ehretiaceae Mart. (1827)], 10(13 ~ 14)/ 395 ~ 400; Trop. & Subtr. (*Cordia* 300, 100 (80 endem.) West Indies; *Ehretia* 75, Trop. OW, only 3 NW)
3. Boraginaceae Juss. (1789) s.s. (excl. Cordiaceae, Ehretiaceae & Wellstediaceae), 116 ~ 117/1900 + ; widespread, but esp. diversified at Medit. to C. Asia
4. Lennoaceae Solms (1870), 3/6 ~ 7; California, Arizona to Mexico, C. Amer. to Venezuela & northernmost Colombia
5. Tetrachondraceae Wettstein (1924), 1/2; N. Z., Patagonia & Tierra del Fuego
6. Hoplestigmataceae Gilg (1924), 1/2; Trop. West Afr. from Cameroon to Gabon
7. Wellstediaceae Novák (1943), 1/3; Socotra Isl., Ethiopia, Somalia

Order 195. Limnanthales Nakai (1930)

1. Limnanthaceae R. Br.(1833), 2/11; Temp. N. Amer.

Order 196. Scrophulariales Lindl. (1833) [incl. Gesneriales Dumort. (1829), Globulariales Dumort. (1829)]

1. Buddlejaceae K. Wilhelm (1910), 8/120(~150), Trop., Subtr. to warm Temp., widespread, but mainly Madag. to E. Asia & 3 monotypic in W. S. Amer., Mexico & Temp. W. N. Amer.
2. Retziaceae Bartling (1830), 1/1; Cape
3. Ellisiophyllaceae Honda (1930), 1/1; E. Asia to India, Philippines to E. N. Guinea
4. Scrophulariaceae Juss. (1789) s.l. [incl. Paulowniaceae Nakai (1949), Selaginaceae Choisy (1823)], 269 ~ 275/4800 ~ 4900; widespread (cosmopolitan), but more abundant in Temp. (esp. N.) and Trop. mts.
5. Orobanchaceae Ventenat (1799) 15/210; N. Hemisphere, esp. OW Temp. & Subtr.
6. Gesneriaceae Rich. et Juss. (1816) s.l. [incl. Cyrtandraceae Jack (1823)], 133 ~ 139/2400 ~ 2900; Trop. & Subtr., few tertiary relicts in Eurasia & Austr. Temp.; Subfam. Cyrtandroideae mainly E. Asia; Gesnerioideae strictly Trop. NW, Klugieae in both, most primitive
7. Bignoniaceae Juss. (1789), 109 ~ 111/750 ~ 800; mainly Trop., esp. S. Amer., few spp. in Subtr. to warm Temp., but primitive
8. Pedaliaceae R. Br. (1810), 13(~17)/75(~85); OW Trop. = Trop. & S. Afr., Madag. to Malesia, to N. Austr. & adj. Isl.
9. Martyniaceae Stapf (1895), 4/15; Trop. to Subtr. Amer.
10. Trapellaceae Honda & Sakisake (1930), 1/1(~2); Eastern Asia
11. Myoporaceae R. Br. (1810), 3 ~ 4/210(~235); *Myoporum* mainly Austr., but through N. Guinea to E. Asia, W. to Mascarene., SE. to N. Z. & Pacific Isl.; 2 monotypic Madag., 1 monotypic West Indies to Trop. S. Amer.
12. Acanthaceae Juss. (1789) s.l. [incl. Mendonciaceae Bremek. (1954), Nelsoniaceae Sreemadhavan (1977), Thunbergiaceae Bremek. 1954)], 228(~250)/3450 ~ 4400; widespread in Trop. & Subtr., few Tertiary relicts to Temp. (e.g. Medit., USA. also Austr.), esp. rich in Indomal. & Trop. S. Amer.
13. Lentibulariaceae Rich. (1808), 3/260 ~ 262; widespread (cosmopolitan), esp. acid bogs & aquatic.
14. Stilbaceae Kunth (1831), 5/12; Cape
15. Oftiaceae Takht. & Reveal (1993), [= Spielmaanniaceae J. Agardh (1858), nom. illeg.] (linking Scrophulariaceae & Myoporaceae), 1/3; S. Afr.
16. Globulariaceae DC. (1805), 2/24; Macaronesia, Eur. Medit., Socotra Isl., W. Asia, S. to Somalia

Order 197. Plantaginales Lindl. (1833)

1. Plantaginaceae Juss. (1789), 3/255 ~ 275; widespread, but mainly Temp. & Trop. mts.; (*Littorella* 3 spp., 1 N. Amer., 1 S. Amer., 1 Eur. & Azores. but *Plantago* 270 cosmop., Austr. 24 nat., 35 Eur.)

Order 198. Hydrostachyales Diels ex Reveal (1993)

1. Hydrostachyaceae Engl. (1898), 1/22; S. Trop. & S. Afr., esp. Madag.

Order 199. Verbenales Horan. (1847)

1. Phrymaceae Schauer (1847), 1/1 ~ 2; E. Asia (Himal. to Japan), E. N. Amer.
2. Verbenaceae Adans. (1763) s. s. (excl. Caryopteridoideae, Viticaceae, Symphoremataceae, Avicenniaceae), 31 ~ 36/1070 ~ 1100; Trop. & Subtr., 1 to a few to warm Temp., mainly Amer.
3. Symphoremataceae Moldenke ex Reveal et Hoogl. (1991), 3/35; E., SE., S. Asia to

Malesia

4. Avicenniaceae Endl. (1841), 1/8; 3 spp. Atl., Caribbean & E. Pacific, 5 spp. OW Trop. (to warm Temp), mangrove or coasts
5. Viticaceae Juss. (1789) (incl. Caryopteridoideae), (24 ~)32/480 ~ 838; Trop. & Subtr., few to Temp. (esp. Asia)
6. Cyclocheilaceae Marais (1981), 2/4; E. & NE. Afr. (1 monotypic gen., 1 tritypic gen.)

Order 200. Lamiales Bromhead (1838)

1. Labiatae Adans. (1763), nom. alt.: Lamiaceae Martinov. (1820) s. l. [incl. Caryopteridoideae of Verbenaceae s.l., Chloanthaceae Hutch. (1959), Nesogenaceae Marais (1981)], 252 ~ 275/6700 ~ 7000; widespread, but mostly Temp., esp. Medit. to C. Asia, very rare in N. Z.

Order 201. Callitricales Dumort. (1829)

1. Callitrichaceae Link (1821), 1/17; widespread (rarely cosmopolitan), but mainly Temp.

Order 202. Hippuridales Pulle ex Reveal (1996)

1. Hippuridaceae Vest (1818), 1/1; widespread, in N. Temp. to Cold (Boreal)

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摘要 这篇文章是作者在1998年发表的两篇文章的续篇。在那两篇文章中作者论述了关于被子植物系统发育和演化问题的基本观点。本文提出木兰植物门(被子植物)的一个新分类系统纲要,将木兰植物门分为8纲40亚纲202目和572科;其中命名了22新亚纲(Annonidae, Illiciidae, Ceratophyllidae, Lauridae, Calycanthidae, Chloranthidae, Aristolochiidae, Polygonidae, Plumbaginidae, Bromeliidae, Zingiberidae, Juncidae, Poaidae, Paeoniidae, Papaveridae, Trochodendridae, Betulidae, Malvidae, Ericidae, Myrtidae, Rutidae, Geraniidae) 和6新目(Degeneriales, Aizoales, Platanales, Dipentodontales, Meliosmales, Balanitales)。并对每个科所包含的属、种数和地理分布作了说明。

关键词 系统; 分类; 木兰植物门; 被子植物; 新亚纲; 新目